THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

Vol. XXII. No. 536.] LONDON, APRIL 15, 1873. [25th Year.] Price 1s.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.

RAMSAY'S PATENT CONDENSED COKE.

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GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.

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These Meters are warranted to measure correctly and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured.

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BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,

Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they have also been awarded in the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.

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HAVE OBTAINED THE

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FOR GAS, STEAM, AND WATER;

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For Locomotive, Marine, and Stationary Boilers.

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AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

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PARIS, 1867.

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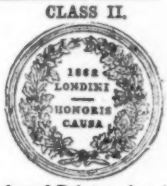

This Paint having been in general use over eleven years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (30s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

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N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs about 20s. per cwt., as compared with White Lead at 30s. per cwt.; a similar economy arises from its use in Steam and Gas Joints, for which purpose it is superior to White Lead.

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THESE PAINTS ARE SPECIALLY PREPARED, and are most valuable for protecting and arresting rust on all ironwork, AND WILL COVER TAR EFFECTUALLY; they adhere strongly, acquire great solidity, do not crack, flake off, or blister by heat, and they resist the effects of SULPHUROUS AND GASEOUS EXHALATIONS.

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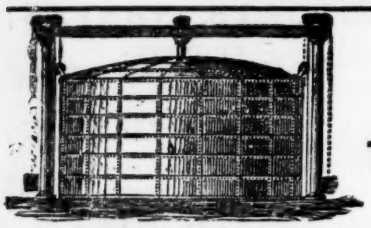

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Wrought-Iron Roofs, Bridges, and Girders; Steam, Hot Water, and Range Boilers; Tanks, Cisterns, &c.,

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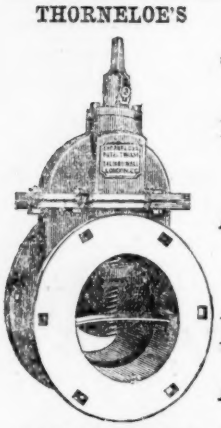

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THORNELOE'S PATENT VALVE

For GAS and WATER, from 3 to 24 inches,

SUPPLIED FROM STOCK.

They are now in use at the following Gas-Works in London:—

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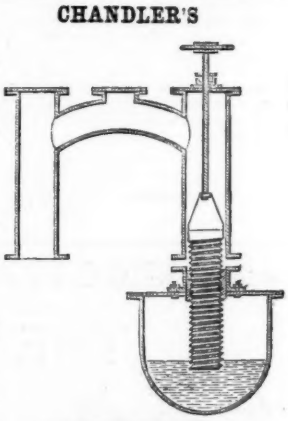

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TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

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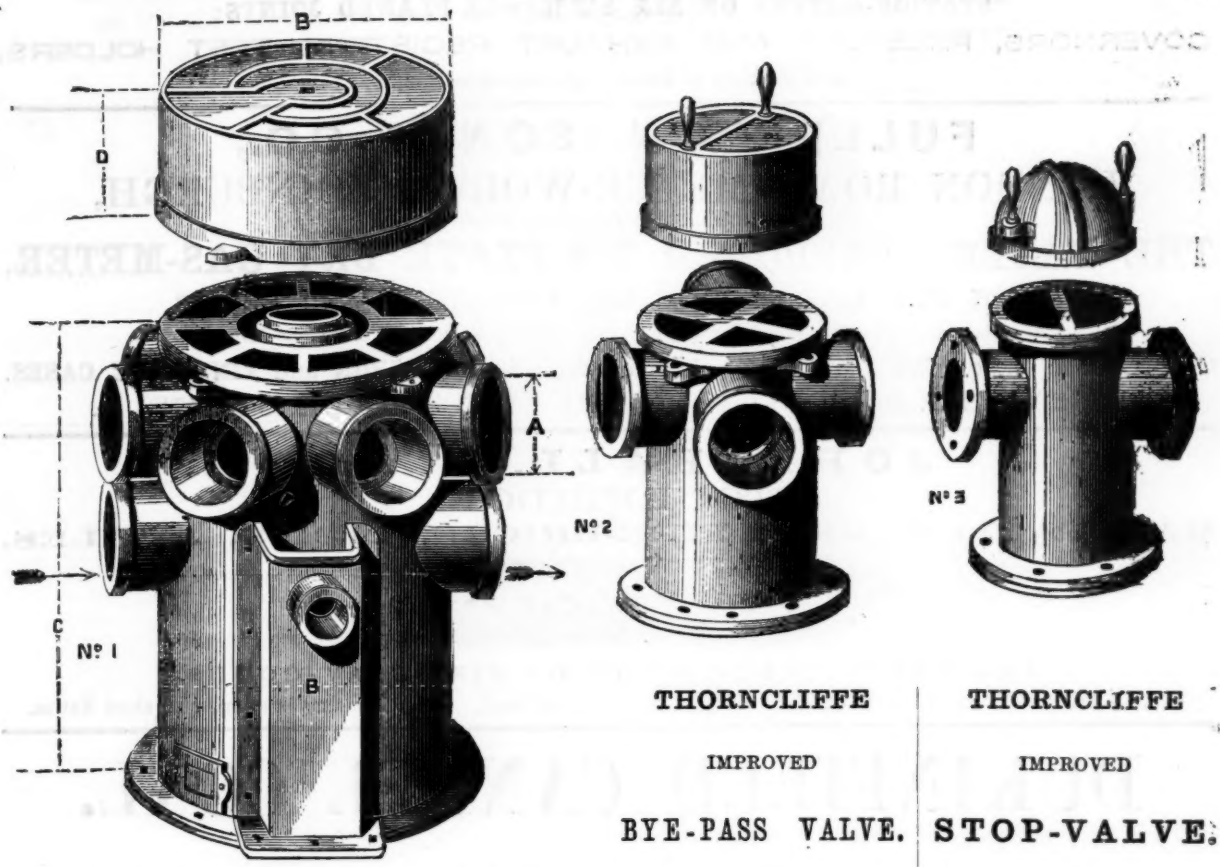
THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD.



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		Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
A	Bore of Pipe...	4	5	6	7	8	9	10	12
B	Diam. of Body.	16	20	23	26	28	31	34	40
C	Height of Tank.	33	35	38	43	46	48	51	56
D	Depth of Cover.	8	9	10	11	12	13	14	16
	Total height...	41	44	48	54	58	61	65	72

THORNCLIFFE IMPROVED BYE-PASS VALVE.

SIZES

From 3 ins. upwards.

THORNCLIFFE IMPROVED STOP-VALVE.

SIZES

From 3 ins. upwards.

In all cases the Covers are cast heavy enough to resist any required pressure.

The advantages derived from the adoption of these Valves are so manifest and cardinal that in the immediate character of the change—the simplicity of the machine—the facility affording for cleaning out connexions between Valve and Purifier—the perfect collection and delivery by suitable overflow of the ammonia, at a greatly diminished depth from ground-line over the old form of Valve—the advantage of connecting on the same level, and at any angle, or opposite to each other, the inlet and outlet pipes without dip or rise—the clear acquisition of space in the purifying-house, by being able to place the boxes nearer together, the new Valve being entirely under the floor—and lastly, though of the greatest importance, the passage of crude and unpurified gas during the change is minimized to the merest fraction, thus preventing the fouling by impure gas the delicate machinery and easily affected exposed movements of the station-meter, thereby preventing the introduction of the enemy (unpurified gas) into the gasholder. Also a dead abutment is offered to all back pressure, imparting thereby to the gauges, governors, and hydraulic seals, a steadiness of action never realized with the once famous, but now fast becoming obsolete, Hydraulic Centre-Valve.

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PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

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IMPROVED CONSUMERS WET GAS-METERS

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THE UNVARYING WATER-LINE GAS-METER,

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IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

GOVERNORS, PRESSURE AND EXHAUST REGISTERS, TEST HOLDERS,

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THE PATENT IMPROVED TIN-PLATE DRY GAS-METER,

WITH SPECIAL FACILITIES FOR ADJUSTMENT AND REPAIR,

The principal parts of the mechanism being accessible by the removal of a single Screw.

GAS-METERS on the WET and DRY principles made in CAST-IRON and TIN-PLATE CASES.

STATION-METERS, GOVERNORS, EXPERIMENTAL & TEST METERS, GAS APPARATUS, &c.

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GASHOLDERS AND TANKS,

Retorts, Retort-Fittings, Condensers, Scrubbers, Purifiers, Station-Meters, Governors, Rack and Screw Valves. Gas and Water Mains always in Stock.

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Combining most recent improvements in principle and manufacture; upwards of 200,000 already in work, giving highest satisfaction.
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HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 7000 IN USE.

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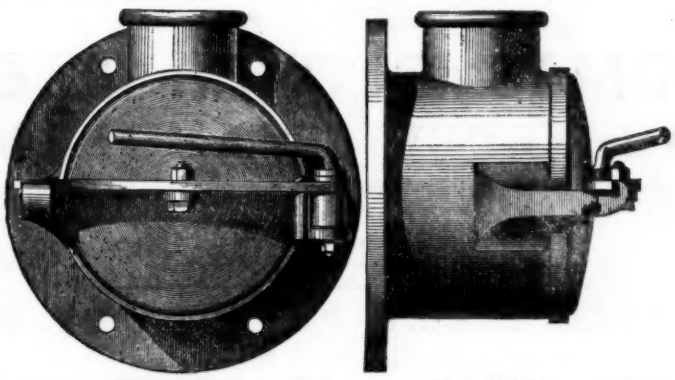
LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



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SIMPLE.

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DURABLE

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

THESE LIDS ARE IN USE AT THE FOLLOWING (AMONG MANY OTHER) GAS-WORKS:—

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„ Gaslight Company, Bow Common.
„ London Gaslight Company.
„ Independent Gaslight Company.
„ Phœnix Gaslight Company.
„ South Metropolitan Gaslight Company.
„ West Ham Gas Company.

The Gas-Works, Royal Arsenal, Woolwich.
„ Alliance and Dublin Gas-Works.
„ Edinburgh Gas-Works.
„ Manchester Corporation Gas-Works.
„ Salford Corporation Gas-Works.
„ Rochdale Corporation Gas-Works.
„ Liverpool United Gas-Works.
„ Birkenhead Gas-Works.

The Nottingham Gas-Works.
„ Newcastle-on-Tyne Gas-Works.
„ Carmarthen Gas-Works.
„ Merthyr Tydfil Gas-Works.
„ Ystrad Gas-Works.
„ St. Alban's Gas-Works.
„ Over Darwen Gas-Works.
„ Aylesbury Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

The following important Testimonial, among others, has been given:—

The Gaslight and Coke Company. Engineer's Office, 6, Westminster Chambers, Nov. 14, 1871.

Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them, and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) F. J. Evans.

SOLE MAKERS OF

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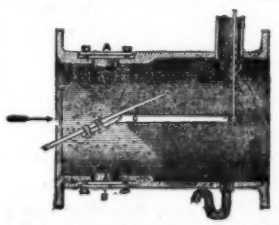
In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communication being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber, upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.



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Messrs. Tangye Brothers and Holman. (Signed) Robert Morton, *Engineer.*

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TO CORRESPONDENTS.

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ERRATUM.—The JOURNAL for April 8 should have been No. 535, instead of No. 534.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, APRIL 15, 1873.

Circular to Gas Companies.

THE publication of an extra number of the JOURNAL OF GAS LIGHTING gives us an early opportunity of calling the particular attention of our readers to the petition of the Gas and Water Companies Association, which arrived too late to be noticed in our last. The prayer of the petition is for the appointment of a select committee by the House of Commons to inquire into and report upon the results of recent legislation affecting gas companies, with a view to affording some relief in the present session, &c. In the petition the grounds for the application are set forth in detail, and it will be strange if the reasons so fully detailed do not induce the House to accord the prayer. We are not without hope that the Board of Trade may, after all, be persuaded to introduce some general measure to the effect desired, but this result can only ensue from the unanimous action of the companies, who should lose no time in adopting the petition, and forwarding it as requested. It will be seen by the letter of Mr. Livesey, the indefatigable secretary to the association, that he is willing to take charge and ensure the presentation of petitions from companies not in a position to command the services of a member, whether connected with the association or not, and we would recommend companies to avail themselves of the offer. In any case no time should now be lost in pushing the matter forward. The duration of the present Parliament is uncertain, and as the session advances the House gets impatient at the introduction of private measures. In the present instance, however, we confidently hope for a favourable result. No better case was ever presented for the consideration of the House. The answer made by opponents will probably be that the present condition of affairs is exceptional and transitory. Exceptional it certainly is, and we wish we could believe it transitory also, but everything points to the conclusion that the advance in the price of coal will be permanent, and we may take it that recent contract prices will be maintained for years to come; in fact, until another rise occurs. The price of iron will fall with a lessened demand, but we fear that only a great and disastrous commercial crisis can bring it back to previous rates, and then only for a time. Upon every ground, then, gas companies have the strongest reasons for pressing for power to raise their prices.

The reports of the half-yearly meetings of the metropolitan companies we gave in our last, and continue to-day, exhibit on the whole a satisfactory state of affairs. In all cases, with the exceptions of the Chartered and Surrey Consumers, maximum dividends have been paid, and small balances left. The worst being over, the future may be contemplated with calmness. Those companies who have power to raise the price of gas need, we think, now have no anxiety, but certainly the present is the time to make an advance. Should coal go down in price, the addition may be taken off again.

The Corporation of London do not seem to be aware that the City of London Gas Act, 1868, gives them power to apply to the gas referees to prescribe the mode of ascertaining the quantity of gas consumed by the public lamps. We cannot, of course, say what plan the referees would prescribe, if applied to; but the system of average meter indication is now so well known, and, wherever adopted, works so satisfactorily, that we have no doubt the referees would approve it. A meter to every ten or twelve lamps would involve comparatively little expense to the Commissioners of Sewers, and would save them the mortification of thinking that they paid for gas which was not consumed. The system might also enable the commissioners to light their open spaces much better without additional cost. The public lighting in the City of London, we have said before, compares favourably with that in other parts of the metropolis, but it might be improved by more lamps.

The commission sitting to revise the price of gas for the Chartered Company have made considerable progress in the two last sittings. The case for the company is now closed, and some witnesses have been examined on behalf of the Metropolitan Board and Corporation. It is expected that another sitting on Thursday next will finish the proceedings; and the commissioners will, no doubt, soon give their decision.

Another fatal accident from the escape of gas is reported from Dundee, the circumstances of which are peculiar, and, we believe, without precedent. A woman rendered insensible by the inhalation of gas lay as in a trance for a whole week, and then died. She received no medical treatment for three days, but after that, according to the newspaper report, the attention of the doctors was unremitting. They do not seem, however, to have had their patient removed into a purer atmosphere, nor to have tried the inhalation of oxygen, which would seem to be the natural antidote. Dundee is supplied with rich cannel gas, and the effects of breathing it (if free from carbonic oxide) would be the same as those produced by the inhalation of chloroform or ether.

DRAINAGE OF WINDSOR.—On Saturday, March 29, the corporation of the borough of New Windsor, acting as the local sanitary authority, appeared at a special petty sessions at the town-hall, before Messrs. Pearl, Pooley, and Weller, borough magistrates, to answer the summons issued at the instance of the Thames Conservators, charging them with having neglected to comply with the notices served upon them in pursuance of the Thames Conservancy Act, to divert the sewage of the town from the River Thames. Mr. English appeared in support of the summons, and Mr. Michael for the sanitary authority. Mr. English, in his opening statement, explained that the proceedings were taken under the 65th section of the Thames Conservancy Act, which made the pollution of the River Thames a misdemeanour, and rendered the offender liable to a penalty of £100, and £50 per day after the first penalty was incurred so long as the pollution should continue. The sewage of Windsor not only passed into the Thames, but polluted Cranbourne Brook, which took its rise in the high ground of the forest, and once added to the picturesqueness of the Royal domain, but which was now covered up in consequence of the abominations which were permitted to flow into it. On the 4th of May, 1867, the first notice was given to divert the sewage, but the proceedings had been deferred from time to time, and the conservators now felt convinced that some pressure must be applied to the board, the steps they were now taking being only of the same preliminary description in which they had been engaged for the last six years. Mr. English admitted that during that time the local board had had great difficulties to contend with, and that they had made great efforts to overcome them. The board had applied to Mr. Gore, the Chief Commissioner of Woods and Forests, for two pieces of land, one being in the centre of the town population, and the other close to the Holly Drive and the Royal Gardens. This application, as we must have seen from the very first, could not be entertained. The sanitary authority now proposed to go to the Ham, near the Castle Sewage Farm, and Mr. English hoped the board would have been enabled to show that they had acquired the land, or had taken some other decisive step to show that there was at length a prospect of the Act of Parliament being complied with, but the same formidable nuisance which had existed for some years still continued. It happened, perhaps unfortunately, that Windsor had a most perfect system of drainage. On the upper side of the town the river entered the sewers and flushed out every impurity, there being a fall of no less than 7 feet to the outfall. This rendered the outfall at Windsor the most offensive and disgusting in the whole river, and it was but a single act of justice to the water companies who drew their supplies from the Thames, each of which were paying the conservators £1000 a year, to enable them to increase the purity of the water. Mr. Michael asked Mr. English how far the nearest intake was from Windsor. Mr. English was unable to answer the question, but it was stated it was 30 or 40 miles. Mr. English further stated that the castle was originally in the same position as the town, but, at an expense of £18,000, the Crown authorities had carried out a system of drainage, which had been in operation for about a month, while the neighbouring town of Eton had two years ago diverted its sewage from the river. Mr. Michael, on behalf of the sanitary authority, said they were now engaged in negotiations for the acquisition of land, and it was hoped that the works might be very soon completed. He asked that the case might be adjourned for two months, at the expiration of which time he hoped the board would have taken such steps as would satisfy the magistrates and the conservators that the nuisance would be very soon stopped. Mr. English did not object to the adjournment, but hoped some practical steps would be taken. The case was then adjourned until the first Monday in June.

Parliamentary Intelligence.

HOUSE OF COMMONS.

MONDAY, APRIL 7.

Brighton and Hove Gas; Glasgow Corporation Water; Grantham Water; and Pontypool Gas and Water Bills, were read a third time, and passed.

Bradford Improvement Bill read first time.

METROPOLITAN BOARD OF WORKS.—Report and accounts for 1872 presented, and ordered to be printed.

Gas and Water Provisional Orders Bill (126) read a second time.

HOUSE OF LORDS.

THURSDAY, MARCH 13.

(*Before the* DUKE OF BEDFORD, *Chairman; Earl* WALDEGRAVE, *Earl* DE LA WARR, *Lord* ELLENBOROUGH, *and Lord* SEFTON.)

COLNE VALLEY WATER.

Mr. DENISON, Q.C., Mr. LOCH, Q.C., and Serjeant SARGOOD, appeared for the promoters; Mr. H. LLOYD, Q.C., and Mr. STANHOPE for the Harrow Water-Works Company; and Mr. RODWELL, Q.C., Mr. BIDDER, and Mr. THESIGER, for certain mill and land owners, petitioners against the bill. There were petitions against the bill by the Duke of Northumberland, and the London and North-Western Railway Company, but no counsel appeared to support them.

Mr. DENISON stated the objects of the bill, which he said were to incorporate a company with power to supply water in the parishes of Bushey, Aldenham, and Elstree, in Herts; and Stanmore, Edgeware, Pinner, Harrow, Kingsbury, Hendon, and Willesden, in Middlesex; and the intended source of supply was a well in the parish of Bushey. The capital asked for was £100,000, to be raised in shares of £10 each, with borrowing powers to the extent of £50,000. Should the original capital be found insufficient, the bill asked power to raise £50,000 more of share capital. Having dwelt upon the present inadequate supply of water to the districts named, the learned counsel proceeded to notice the petitions presented against the bill. He objected to the *locus standi* of the petitioners, who were described as millowners upon the river Colne, on the ground that their interests were not affected by the bill. They alleged in their petition that the sinking of a well, as proposed by the promoters, near to the river Colne, would interfere with their supply of water; but he cited the case of the Windsor and Eton Water Bill, and the Birkenhead Improvement Bill, to show that an application for power to sink a well in close proximity to a river or to another well, had been held in both Houses not to be an interference which would give a *locus standi* to parties interested in the neighbouring river and wells. He further objected on similar grounds to the *locus standi* of the Duke of Northumberland, and stated that this was a much stronger case on account of the distance at which his Grace's property was situated from the proposed works.

Mr. RODWELL was about to reply, but

The CHAIRMAN intimated that the committee were of opinion the petitioners were entitled to their *locus standi*.

The evidence was then proceeded with, and the greater part of the sitting was occupied with the examination of witnesses as to the foul state of existing wells, the prevalence of zymotic disease, which they traced to the scarcity and impure character of the water, and the general desire of the inhabitants for an improved supply.

Mr. *Simpson Noakes*, examined by Mr. LOCH, stated that he resided at Bushey Heath, and was a member of the Watford Board of Guardians, vice-chairman of the Watford Highway Board, and a member of the Water Committee of Bushey parish. He therefore had an intimate knowledge of the condition of the neighbourhood as regards the supply of water—a subject to which he had for some time turned his attention, as connected with Bushey especially. The population of the new town of Bushey was 1036. The condition of the supply of water there was very bad indeed, and had occupied the attention of the guardians of Watford Union for some time. Their medical officers stated there was a very extensive outbreak of typhoid fever not only breaking out constantly in fresh places, but also recurring in houses where it had previously appeared. They attributed this to the impurity of the water which alone the inhabitants of that part could obtain. In September, 1871, Dr. W. Johnson, one of those officers, reported that he had evaporated some portion of the water, and found distinct particles of fatty matter, the inference to be drawn from which was that the well was foul with sewage. The board ordered the inspector of nuisances to examine the wells of the district and make a report. Witness accompanied the inspector upon his visit. They examined the wells of the houses where the typhoid fever had existed, and a great many others, and the condition of the water was very bad. A number of specimens were taken to submit to the inspection of the board. The wells which supply the people of Bushey New Town are simply holes dug in the surface chalk, receiving surface drainage, and the soil is so porous that all the refuse thrown upon the gardens, apart from that which percolates through the cesspools, affects the character of the water. The clerk of the board was desired to procure carefully-selected samples of the water, which were forwarded to Dr. Attfield, the analytical chemist of the Pharmaceutical Society, for examination and analysis. The board of guardians then required the churchwardens and overseers of Bushey to take immediate steps to remedy the nuisance, and under the Sewage Utilization Act of 1867 they constituted the vestry a sanitary committee for the parish. The vestry appointed a committee to take the whole thing into consideration, the committee reported, and the board then gave them further power to obtain a water supply for the parish. For this purpose estimates were obtained from practical engineers and contractors, but on an examination of the plans the committee thought that the expense was so large as to be beyond the reach of a single parish. Although the estimates were somewhere between £8000 and £9000—approaching £9000—they felt convinced that it would cost at least £10,000 to do it, and that it did not include the whole of the parish, and the expense would have to be raised by rate to which all the parishioners would have to contribute. During the time they were consulting they had communications from various persons in the neighbouring districts, who were quite as badly off for water, and they hoped that something might be done to extend the advantages of their water supply to them, particularly to Stanmore. As it was proposed to place their reservoir on a high level, at the top of a hill at Stanmore, they would be able by mere gravitation to supply Stanmore. This was the origin of the scheme now before the committee.

Cross-examined by Mr. BIDDER: The wells from which samples of water were taken and analyses made are sunk in the chalk at Bushey New Town, and they vary from 20 to 90 feet in depth. There were five from which water was taken for analysis. They are generally regarded as superficial, but some of them were 90 feet deep. The well which was 90 feet deep showed a very bad analysis. In that case, certainly there had not been proper precautions taken to keep the surface water from running into it; in all the wells in the neighbourhood it is impossible to prevent the percolation even from the gardens. They made an application to the Watford Water Company to supply them, and their answer was to the effect that they would supply them to a height not exceeding 100 feet from their pumping station, at 9d. per 1000 gallons, but above 100 feet and not exceeding 130 feet, at 10d. per 1000 gollons. On examination they found that the 130 feet, the highest point to which the company would consent to supply them at all, only took about one-third of the way through the central portion of the village, leaving the whole of the upper part of Bushey and a great part of the middle entirely unsupplied. The estimates and specifications prepared, by the two firms to which he referred did not include the whole of the parish and therefore the vestry saw that the estimates would have to be increased if they included in the supply all those who would have to contribute by a rate towards it. The population of Bushey was about 450. He did not know the population of the district proposed to be supplied, he thought it was about 25,000 or 27,000, including Harrow. It was not proposed to spend £100,000 in the first instance; that was the total original capital they asked for. The estimate deposited according to the Standing Orders for the works to be constructed in the first instance was £100,000; but that included portions of the scheme which he thought had been withdrawn from the bill, and he imagined that the rise in the price of iron since this scheme was originated would make a great difference in the amount.

FRIDAY, MARCH 14.

Mr. *William Winkley*, clerk to the Local Board of Health of Harrow, and secretary to the Harrow Water-Works Company, was examined by Mr. LOCH, with reference to affairs at Harrow.

Mr. *Charles Caleb Lovejoy*, surveyor to the Local Board of Health at Watford, and manager of the water-works, examined by Serjeant SARGOOD, stated that the amount of water pumped by them in a day of 15 hours averaged 300,000 gallons. They pumped, perhaps, some 40,000 or 50,000 gallons less in winter than in summer, or less the amount of watering the streets. He believed the works were erected in 1854. The London and North-Western Company's well was commenced, he thought, in 1864, but would not be certain. He did not know the date when they began pumping. It had not diminished the quantity of water at the water-works. He had never heard what quantity of water the London and North-Western Company pumped out of their well. There were two borings at breweries within 150 yards of the water-works. They had done no mischief whatever. The railway well was perhaps half a mile off. The well which the promoters wished to sink would be nearer the water-works than the railway well.

Mr. *Samuel C. Homersham*, C.E., examined by Mr. DENISON, stated that in 1840 a company was formed with the idea of supplying London with this water, and his attention was directed to the district in company with Mr. Stephenson. After an examination which satisfied himself and a great many other engineers, it was proposed to pump 10 million gallons a day. It was ascertained that that could be done without in the slightest degree injuring the river, merely by intercepting the water that now flows into the sea, and which had no connexion with the Colne in any way. That scheme came to an end in consequence of a dissolution of Parliament. About 1200 square miles would be in direct communication with the well proposed to be sunk at Bushey—that is, with the chalk under Bushey. One-sixteenth of an inch of rain absorbed into that ground would supply a great deal more than this company proposed to take. The average of rainfall in the district was 26 inches, the least 22 inches, and the maximum 32 inches, and this, falling on the steepest side of the chalk hills, did not run into the ditches or drains, but was absorbed into the chalk. Every drop of water must be got from the rain that falls upon the ground here. Witness here explained on a map the way in which the water absorbed into the chalk found vent into the sea by some broken stratification, and said by sinking a well at Watford in such a manner as to exclude all the top water, by lining the well to a considerable depth, and making it impermeable by means of a cast-iron side, and then boring until they intersected a fissure, they could get water rising to the surface which could not be obtained from the shallow wells in any way, and without affecting them or the river. The well sunk in Bushey Meadows yielded 1,800,000 gallons a day. In 1850 Mr. Paten consulted him as to making some borings at Redbourn to supply the millowners. Five borings were put in, which altogether produced 750,000 gallons a day. In 1852 he made some extensive works with a view to supplying Plumstead, Woolwich, and Charlton with water, and by twice boring into the chalk at a great depth, he was able to supply 1,200,000 gallons a day. This well was not lined with cast-iron cylinders, and a well within 50 yards had the water lowered while they were pumping, but it rose when they left off. He sank a well at Tring which supplied Tring, Aylesbury, and Aston Clinton, which had been at work for five years, and not a single well had been affected. He also made works at Caterham and Canterbury. At the latter place there was a spring called the Silver Hole Spring, and neither this, nor the wells, nor the river Stour, were affected. The Kent Water Company's works had not injured the Ravensbourne nor any wells. The works at Croydon did not affect the Wandle, and water was got in the same way from the chalk at St. Alban's. Dover, Margate, Ramsgate, Brighton, and Deal were similarly supplied, and at Hull 6 million gallons a day were obtained from the chalk. In answer to the question as to whether the sinking of the proposed well would affect the river Colne, witness said he considered it impossible if they went down to a hard stratum of chalk, and if the well was made impermeable. If they put borings in so as to intercept the water from those fissures, the water would be taken from what is usually going to the sea underground, and not from what comes up in this locality at all. He considered that at Bushey it would be ample to line down to 40 feet; 60 feet would be the outside depth.

Cross-examined by Mr. RODWELL concerning the case of *Dickenson v. The Grand Junction Canal Company*, *witness* said that the pumping of water from the company's well did diminish the stream of water, but it was in consequence of the sides of the well not being made water-tight. He was aware that experiments were made under Sir William Cubitt's direction; the puddling had no effect upon the diminution of water in the stream, because the puddle was an improper puddle to have used. He did not agree with the theory that the Colne represented water which those underground streams did not convey to the cistern below. The Colne had nothing to do with that underground water.

Mr. *Robert Banting Paten*, of St. Alban's, sinker of Artesian wells, stated that during the thirty-five years that he had known the valley of the Colne a great many wells had been sunk at different places into the chalk, and he had never heard of any perceptible effect having been produced on the waters of the Colne. The river Ver had been increased by borings. In 1840 his father made some experiments in Bushey Hall Meadows to see what quantity of water could be obtained from the chalk formation. A well was sunk there 34 feet deep, and four small borings put in the bottom 100 feet deep. The diameter at the bottom was 12 feet 6 inches, and at the top about 20 feet. The two steam-engines pumped between 2 million and 3 million gallons a day. The pumping commenced in March and finished in October. The well was about 100 yards from the river Colne. He never heard that any damage was done to any well in the neighbourhood or to the Cole. Mr. Clutterbuck asked Mr. Robert Stephenson to keep the pumps going three days and three nights. The result of that was that although they pumped at the rate of 2 million gallons a day they did not get the water down within 10 feet, and it had no effect upon the neighbouring wells. His father contracted with the millowners of the Ver to get 1½ million gallons of water a day, and five borings were put in, which he superintended. At that time the Ver was nearly dry at that point. He thought they got very nearly 2½ million gallons of water, which was turned into the river, and cured it from the defect it had been previously suffering from. He sunk a well more recently in the Bushey cutting of the London and North-Western Railway Company, which had since been sunk lower, and was now about 400 feet deep altogether. The quantity drawn from that well was 250,000 gallons a day. It was pumped from every day and sometimes in the night. He knew Mr. Savill's well, and gauged it on the 6th of March, and found 11 feet 6 inches of water in it. That well was 65 feet deep and possibly 300 yards from the company's well. Witness gave a list of between 30 and 40 places in the surrounding districts where he had sunk wells, and said he thought the total quantity produced from these wells was a great deal more than 5 million gallons a day. He had never heard of their affecting any of the neighbouring wells nor the flow of water in the Colne.

Cross-examined by Mr. BIDDER, *witness* said that he gauged the wells at Redbourn at the time he put in the borings there, and had done so since, and found that they made no difference. Being asked whether he did not know that the borings entirely failed in their object, and that the millowners found that they were merely taking the water from the same sources and putting them in another way, and that the volume of the stream was not increased, he said that the volume of the stream was increased, and the millowners did get a benefit. He had heard that Mr. Savill's well was dry before the wet season came on. He could not see that it had anything to do with the London and North-Western Company's well. He did not know that the results of the experiment in Bushey Hall Meadows in 1840 showed that the wells were materially affected or the stream either. He knew that evidence was given to show that the stream was not affected.

Re-examined by Mr. LOCH, *witness* said with regard to the borings which supplied the Vor, that though Mr. Stephenson failed to convince Mr. Clutterbuck, Mr. Stephenson himself was satisfied with the result of that experiment.

Mr. *George Edwards*, of Kingsbury Mill, St. Alban's, examined by Mr. DENISON, stated that the borings at Redbourn, and lowering the stream, added to the stream 1,185,120 gallons, and none of the springs were the worse for it.

Mr. *J. F. Bateman*, C.E., the engineer of the scheme, examined by Mr. DENISON concerning Mr. Stephenson's reports. He stated that he had read a great deal that Mr. Clutterbuck had written and said upon the subject, and he had carefully considered the reports of Mr. Stephenson, and the facts which he presented in those two reports, and the conclusion in his mind was that any quantity of water that might be withdrawn from a deep well in the chalk for the supply of this district would be absolutely unfelt in the valley of the Colne. He did not think that it could in any degree be perceptible. The whole extent of the chalk which might be supposed to contribute to any one particular spot, if it were considered an homogeneous mass, was so immensely large that an abstraction of 3 million or 4 million gallons would not be appreciated. He might mention this: that the natural watershed—that is, the declivity of ground from which the water would flow from the surface down to the junction of the various streams that form the Colne at Rickmansworth—was about 143,000 acres, call it 150,000 in round numbers. But that did not represent the whole amount of chalk—that was merely the natural watershed—the chalk was very much larger. One million gallons of water a day raised from that district day by day, 365 days in the year, would only amount to an eighth of an inch of water in the whole twelve months, if drawn from the whole of that area. For the purpose of preventing any possibility of injury to the neighbourhood, he proposed to make the first 60 feet from the top of the well absolutely water-tight. Witness then explained the proposal to their lordships, and further stated that about a third of the population now proposed to be supplied lies in the valley of the Colne, and therefore a third of the water to be pumped out will be returned to the Colne; and if the springs and further supplies of the Colne be not further interfered with, and the water be taken from deep sources, it would be a positive gain to the Colne by that quantity of water.

Cross-examined by Mr. BIDDER, *witness* stated that he had looked over the plans and estimates spoken of by Mr. Noakes for providing local water-works at Bushey, and all he could say was that the estimates were very much too low. Instead of £10,000 it would probably have been £20,000. It would not have been cheaper than this company's £100,000. That would have been £10 a head, and this was £5 a head. Twenty thousand for £100,000 was £5 a head; £20,000 for under 2000 was more than £10 a head. His estimate of £100,000, which was for the scheme as deposited, represented the cost of supplying 42,000 people, which was only about £2 10s. a head.

This closed the case for the promoters.

Mr. BIDDER then called Professor *David Thomas Ansted*, F.R.S. and F.G.S., who stated that he was engaged in the case of *Dickenson v. The Grand Junction Canal Company*, and a great many cases of the kind. Admitting that the body of water in the mass of chalk was enormously large, it appeared to him clearly made out by all the experiments he had made, and all the observations he had had the opportunity of making, and indeed from all the evidence he knew of, that whatever quantity of water was taken from any part of the chalk at any time by wells and removed to a district, it could only come from the rainfall over the district, and must therefore diminish the quantity on the surface. The surface would be the first to feel it; not always the wells, because the chalk, as was well known, was broken up—some parts were comparatively hard and did not allow the water to go through readily, some parts were very much fissured and allowed the water to go through very readily; and possibly one fissure being tapped in one place, and another fissure being tapped in another place, two wells, though closely adjacent, would not be affected, but in either case the water would come originally from the surface and from the rainfall. No doubt there was a large body of water in the chalk, and no doubt a large number of springs issued from the chalk on the sea-coast, and were fed almost entirely from fissures in the neighbourhood. But, allowing that it was so, the water level in the chalk, if it was lowered in any case, must be replaced from above, and the river being the overflow of what there is on the surface, it must either bring lower down the course of a stream the point at which the river originally began, or diminish the side springs that come into it by lowering them, the water being gradually carried down to the body of the chalk, which it is, very rapidly and to a very large extent indeed. Water was very slowly conveyed laterally through solid chalk; it was conveyed by fissures readily, and the fissures are enlarged by the passage of the water through them; but it was conveyed very slowly in a lateral direction—that is, if you exhaust the bottom of a well, take out all the water and comparatively dry the chalk round the cone formed in that way from a well, the water that comes in from any distant sideway in the lower part of the well would be comparatively small. It was well known, because after the wells had been kept dry for a time, the water comes in very slowly indeed, though at a short distance the chalk contains two gallons of water to a cubic foot. He thought that it might be considered now as almost recognized that in a district such as the chalk, where they knew the evaporation was very great at all seasons, the actual quantity of rainfall that could be depended upon to add to the subterranean store would not be more than 5 inches, the rainfall being supposed to be 25. He had no doubt whatever that Mr. Homersham would be able to get a quantity of water, but it could only come from water that would otherwise flow into the river; it would be the overflow, and would therefore be in fact the supply of the river Colne. Quite close to the point at which the well was proposed to be sunk there was a quarry of chalk that showed the nature of the strata. They consisted of the open beds of the upper chalk, and they were certainly very much fissured. That was the character of the upper chalk generally, and it was the local character as shown in this quarry. The river flowed at a very short distance. It was proposed to puddle the well 60 feet. It might be that that 60 feet would have some effect upon the conveyance of the water, but it was not at all likely, because the upper chalk was generally cracked to a considerable depth. It was generally an open rock—the existence of flints in it made it so—therefore the water would of course take the easiest course, and if the well were sunk within so short a distance of the river, he imagined that the greater part of the water would come almost directly from the river. He thought it most likely the water would come directly from the river, but if not directly from the river it would come from the streams and sources that supply the river.

Mr. *George Edwards*, examined by Mr. THESIGER, stated that he was formerly a civil engineer, and was engaged by Sir William Cubitt to make the experiments suggested in the case of *Dickinson v. The Grand Junction Canal Company*. He described the effect of the pumping near the Bulbourn, and said that, assuming a deep well to be made in the position in which they proposed to place it near the river Colne, and applying the practical experience he had obtained in the valley, he had no doubt as to the effect whatever. As far as he could judge of the strata, if they were anything like the strata in which his experiment was tried, which it was only reasonable to suppose, there must be an effect produced by a large well sunk on the side of the Colne, diminishing the flow of the river.

MONDAY, MARCH 17.

Mr. BIDDER stated that the millowners had been considering how far they could go to meet the promoters, and he was authorized to offer a clause to the following effect, as embodying their requirements:—"That the company may from time to time contract to supply water in bulk, beyond the limits of the Act, for domestic use or other purposes, at any place or places situate in the valley or watershed of the rivers Colne or Vor above the pumping-station, without any limit, or any place beyond the limits of this Act situated lower down in the said valley or watershed, and being also within a distance of 3 miles therefrom, measured radially in a straight line from the said pumping-station, provided that it shall not be lawful for the company to supply water, either directly or indirectly, for use at any place or places situated beyond the limits last aforesaid."

Mr. LOCH accepted the clause on behalf of the promoters, subject to a few verbal alterations.

Mr. HORACE LLOYD having addressed the committee on behalf of the Harrow Water-Works Company,

The Rev. *Robert Middlemist* was examined by Mr. STANHOPE.

THURSDAY, MARCH 20.

The clauses of the bill were proceeded with in detail, and the proposition on behalf of the millowners was incorporated therein. The preamble of the bill was then passed.

HOUSE OF COMMONS.

THURSDAY, MARCH 13.

(*Before Mr.* ELLICE, *Chairman; Lord* BINGHAM, *Major* WALKER, *and Mr.* WHATMAN—*Mr.* BONHAM-CARTER *sitting as referee.*)

PONTYPOOL GAS AND WATER BILL.

Mr. GRANVILLE SOMERSET, Q.C., and Mr. SAUNDERS appeared for the promoters; Mr. STEPHENS and Mr. BIDDER on behalf of the inhabitants and consumers of gas and water at Pontypool.

Mr. SOMERSET said the object of the bill was to incorporate and to confer powers on the Pontypool Gas and Water Company. The preamble recited that the gas and water company was registered on the 22nd of August, 1872, with a share capital of £26,400, of which £24,286 was paid up, and that they had borrowed £4500. Coming to the history of the water company, he stated that water being very much required at Pontypool a number of gentlemen in 1850 formed themselves into a company, called the Trebythin Water Company, and they still continued to supply the town. Gas was first introduced into Pontypool by a Mr. Williams, and, after passing through several hands, the undertaking was sold to the Trebythin Water Company, who entered into possession on the 1st of January, 1872, and on so entering into possession they changed their name to the Pontypool Gas and Water Company, and were registered accordingly. The bill sought to raise their capital to £40,000, and the borrowing powers to £10,000. They sought to pay, as was provided in these Acts, 10 per cent. upon the old capital and 7 per cent. upon the new. With regard to the gas-works, when the company purchased them additions were required to be made, and they thought it their duty to do all that was required for the town and district. Of course, it was necessary to obtain money for that purpose, and they thought it best to come to Parliament and subject themselves to the provisions of the General Acts, getting also the advantages which an Act of Parliament gave. With regard to water, as he had stated, the company was formed in 1850. They took water from two springs, and it was then intended to make a reservoir for the supply of the town. But in making that reservoir they found, to their surprise, a spring which had been amply sufficient up to this time, with the addition of the other springs, to supply the town, and therefore they did not make the reservoir. They took powers, however, in this bill to make the reservoir, and should it become necessary they would do so. Pontypool and the neighbourhood was a very hilly district, and a large portion of the population could not be supplied with water. They proposed to supply all who could be supplied, and taking the population at 10,500, and assuming—which was a great deal beyond the average—an increase of 1500 in the next 20 years, that would give a population of 12,000, and the company would be enabled to supply that population without any difficulty with 20 gallons per head per day, which, he was informed, was infinitely beyond their requirements, as it was not a manufacturing district. The reservoir which they took power to make would contain something like 4 million gallons, so that there would be no difficulty at all even in the driest possible season in supplying what was wanted in the town. The first petition against the bill was that of Mr. Hanbury Lee's trustees, but he believed the company had so nearly agreed with them that it would be unnecessary to trouble the committee with their petition.

Mr. STEPHENS said if any settlement had been come to he should like to know of it as early as possible, as it might affect what he had to say.

It was stated on behalf of the trustees of Mr. Hanbury Lee that they did not intend to oppose the preamble, and that the clauses which they required were finally settled with the promoters.

Mr. STEPHENS said he appeared for the consumers of gas and water in the district, and, of course, arrangements which had been made with other parties would affect them. They wished to see the clauses in sufficient time to enable them to shape their case accordingly.

The CHAIRMAN: Is there any opposition at all to the preamble?

Mr. SOMERSET said that was what he was going to ask when he came to his friend's petition. Mr. Moggridge was another petitioner. He had some works at Pontypool, and had used some portions of the water which the company proposed to take. He believed that they were agreed, at any rate, upon the principle of his objection, and had come to terms with him. Then came the petition of the inhabitants and consumers, represented by Mr. Stephens. It was a petition of 175 people out of the whole population. He was happy to say that the promoters had a very large body on their side; for in the district they proposed to supply there were no less than five local boards, all of whom approve of the bill. However, these gentlemen had a right to be heard, and he must deal with their petition. They said that they were inhabitants of the district, and that they objected to the bill on the ground that it would confer a statutory monopoly. Now, of course, Parliament had settled that all gas and water companies that had an Act of Parliament were to have a monopoly in the district. The petitioners further said that the price proposed to be charged was excessive. That would be a question for the committee. He might mention that, whereas they were now paying 11s. 6d. for coal, under a contract which would expire in a fortnight, they had not the slightest hope of getting it at the end of that time under 20s. or £1 1s. a ton, if, indeed, they could get it at that price. Pontypool was a very straggling place, a circumstance which also very much affected the price of gas. The petition said that the gas supplied by the company was inferior in quality and insufficient in quantity, but he thought he could show that that was a mistake. It said the same with regard to the water, but evidence of consumers would be given as to what they thought of it. The petitioners especially objected to the company being released from the necessity of keeping up a constant pressure. Now, the promoters objected to the constant pressure, though they gave it, for it was one thing to give constant pressure, and quite another thing to be bound under

penalties to give it. They always had given constant pressure, and always proposed to do so, but they distinctly declined to be bound to do so under Act of Parliament. The petitioners then asked for the rateable value to be taken instead of the rack-rent, which would be 20 per cent. in the consumers favour. With regard to the rates, the company would be able to contrast them favourably with other rates in the neighbourhood, and he did not think the committee would consider them excessive. They then said that the company ought to be obliged to furnish a supply of water to flush the streets and sewers free of charge. He did not think his learned friend would find a precedent for that; it was a most unusual thing, and if the question was raised at all it should have been urged by the local boards, and not by these gentlemen. He should call evidence to contradict the various portions of the petition. He really did not know whether these gentlemen intended to oppose the preamble of the bill; because, being consumers of gas and water, he supposed they wanted those articles, and therefore could hardly wish the bill to be thrown out. He would ask whether they opposed the preamble, or whether they only opposed price and other matters which could be settled on clauses.

Mr. STEPHENS: My answer is, we oppose the preamble.

Mr. BIDDER stated that he had agreed as to certain clauses with the promoters, and should not, therefore, oppose the preamble.

Mr. *Andrew Hair*, examined by Mr. SOMERSET.

I am manager of the Pontypool Water-Works. I became manager in 1855. The works were instituted in 1850. We have struck out of our bill certain agricultural districts, by agreement. With regard to water, the population we propose to supply is estimated at between 10,000 and 11,000. Taking the increase in 20 years at about 1000, thus making the population 12,000, we propose to give 20 gallons per head per day to that population—viz., 240,000 gallons. Speaking from 18 years experience, I consider that to be an ample supply.

Mr. SOMERSET: You think that would be ample not only for domestic purposes but for the works in the district?

Witness: We supply very little water for trade purposes; the works have independent supplies of their own. Our water is derived from three springs. One of them—the principal one—is called the reservoir spring. It was originally intended to make a reservoir at that spot, and, in making it, they found the spring, so that the reservoir was not required. The town is wholly supplied from that spring. We take powers in the bill to complete and maintain the reservoir. There will be no practical difficulty in the way. The reservoir will contain about 4½ million gallons, and will cost about £2000. With regard to capital, the present amount is £26,400, of which £24,300 is paid up. We propose to raise the remainder, and also new capital to the extent of £13,600. We have borrowed £4500, and we propose to take borrowing powers to the extent of £5500 more, making a total of £10,000. The original gas company was a private concern begun by a gentleman named Williams, and it afterwards came into the hands of Mr. Price. Gas lamps were first lighted in 1853. After Mr. Price's death, Mrs. Price succeeded to the works. Our company bought them of her, and we entered into possession in 1872, changing its name to the Pontypool Gas and Water Company. We were registered in that name in August last. In order to give a proper supply of gas and water, we found it necessary to raise more money. Pontypool contains somewhat over 400 houses. The rest of the district is very straggling.

Mr. SOMERSET: The petition of the inhabitants says that the supply of gas and water is in many respects defective and objectionable. Have the complaints with regard to the gas been numerous?

Witness: No. There were complaints previous to the erection of our new works; but since then there has not been a complaint from a single person. The works have been in operation from the commencement of this year. On coming into possession, we found the works very inefficient, and we have done what we believe to be right in improving them. We have had complaints as to water, but not many. Our water is never bad except after excessive rains; it is then turbid for a day or half a day. The springs are very sensitive, and the colour of the water affected by a shower. A sample was taken on Thursday last by Mr. Mackintosh, the superintendent of police, and sealed by him. I brought it to London, and delivered it to Dr. Whitmore.

Mr. SOMERSET: The petition states that the price proposed is excessive, and beyond that charged by other companies in the neighbourhood.

Witness: I say that, looking at the price of labour, coal, and other materials connected with the manufacture of gas, and taking into consideration the small make, the price is not excessive. We now pay 11s. 6d. per ton for coal. That is by contract, which began in April, 1872, and will end next April. The agreed price was 9s. 6d., but a clause was inserted providing for the payment of an additional 6d. a ton for every 10 per cent. advance in wages. There have been two such advances, making the cost of the coal 10s. 6d., besides 1s. a ton for hauling.

Mr. SOMERSET: What will be your position after April next?

Witness: Some time ago we applied to different coal proprietors for tenders, but we only obtained one, the others stating that they were not in a position to tender. That one was 18s. a ton, with an advance of 1s. per ton for every 10 per cent. advance in wages. We have entered into that contract for six months. It will cost us 19s., besides the possible increase from an advance in wages. We are now under strike, and it has been recommended to hold out for two years. The houses we supply are chiefly small, and of an inferior description. With the exception of the two main streets, they are principally cottages, let at £4 or £5, or £6 or £7 a year. That of course affects our profits. We are charging the same as other gas companies similarly situated. The Abersychan Company, immediately adjoining us, have this session applied to the Board of Trade, and obtained a confirmation of their maximum of 6s. We are now in a very much worse state of things from that which formerly existed. Mrs. Price only paid 7s. 6d. a ton for her coal. The price is now doubled, and wages are increased 20 per cent., lime 50 per cent., and iron nearly 100 per cent. The water company paid 5 per cent. in 1855; then the dividend increased to 6; it has never exceeded 7½ per cent., and that dividend was only for a few years. We ask for 10 per cent. on our old capital (if we can make it), and 7 per cent. on the new. Since we have supplied both gas and water, we have declared one interim dividend for half a year at the rate of 5 per cent. per annum. That was as much as we thought we were justified in dividing. Under present circumstances, I think 6s. is a moderate price. If we had a less price, I do not think we should be able to raise the necessary capital; at all events, I would not take a single share myself. We have provided in the bill for all necessary works. We propose to make a reservoir. We do not now filter, but we intend to do so if we can get powers. We keep a constant pressure now. The water has not been turned off for the last two years, except for repairs or laying on services. We object to being subject to penalties for turning off the water in case of repairs; and it is not usual. The petition states that the water-rate should be on the rateable value of the houses supplied, and not on the rack-rent. We say otherwise, and that it is contrary to previous legislation. The rateable value is now 12½ per cent. below the rack-rent. In the case of cottages, 25 per cent. is taken off. The petitioners ask to be supplied with water for baths and other purposes free of charge, which is contrary to all rule and precedent. We have made a nominal charge of 1s. each per annum. We have also offered to supply water for flushing the whole of the sewers if the local board would erect proper receiving-tanks, but they have not moved in the matter. There are five local boards in the district, and none of them oppose the bill.

Cross-examined by Mr. STEPHENS: We are in five local board districts—that is in the proposed limits. The present population we intend to supply will not exceed 11,000. The bill has been altered as regards the limits since it was before the referees. The population of the district was then stated at 25,000. Part of it is a hilly district which we cannot supply. The existing reservoir was made in 1850, but we do not use it. In excavating a spring was found, and the reservoir was not proceeded with. It was not known that there was any water there. The discovery of the spring was an accident. The water flows direct out of the spring into the pipe. It is about 20 feet underground. A portion of the surface water in heavy rains finds its way into the spring. There is no filtration, and in 29 days out of 30 it is not required. Clause 47 of the bill provides for filtration. We have made no estimate of the probable cost, but we are prepared to make it whatever the cost may be. We do contemplate filtering. We propose to make the present reservoir water-tight. It has remained in its present state 22 years. We have not required it, or we should have put it in a proper condition. The pipe from the spring is 12 inches in diameter. There is a pipe from another spring, 3 inches in diameter. It is only needed in the summer season; for nine months in the year it is not required at all. After heavy rains surface water gets into it. We have had no complaints about it. There has been occasional stoppage of the service-pipes, sometimes from particles of sand and occasionally from a frog—never from water lizards. The old water company paid sometimes 7½ per cent. I cannot say what the old gas company paid. It was a private concern. The greatest make in one year was 7,700,000 feet. The purchase-money was £11,000. Mrs. Price advanced £4500. We make no distinction in the capital between gas and water. The two were regarded as about equal. The water-works have been valued at £13,400. We created 1100 additional shares to pay for the gas-works and alterations to be made. There is to be a general dividend upon the united capital. If there were a deficiency in the dividend on the gas, the dividend on the water would have to assist it; but we do not propose to make any distinction between the two. I am not aware of any company in our district that can charge 6s. except in the single case that I mentioned.

The CHAIRMAN: If I follow the gist of your cross-examination, one of your objections is as to the price of gas.

Mr. SOMERSET: No doubt.

The CHAIRMAN: Then between this and to-morrow you had better consider what clauses can be agreed upon. The committee feel, as in the case of the Brighton Bill, that there are circumstances which might tempt them to give a higher rate than they would otherwise be disposed to give permanently. The question is whether you cannot agree to clauses, leaving that matter to the Board of Trade.

Mr. SOMERSET: I am ready to adopt a sliding scale.

The CHAIRMAN: We are not here to legislate on the subject, but we would rather that you should put yourselves under the Board of Trade. We do not want to lay down any general rule that would be quoted as a precedent; we have not materials enough for it. Nobody can tell what the circumstances really are.

Mr. SOMERSET: They are very melancholy at present. We will attend to the suggestion of the committee.

Cross-examination continued: We can make nothing of our residual products, ammoniacal liquor and tar; they are of no use, but are a positive nuisance to us; they are a loss instead of a profit. We have to haul away the tar from the tanks. There has been no sale for it since the strike commenced. We have made an allowance for the sale of residual products in the future. Our tar would probably produce about £50 a year provided the works were going. Ammoniacal liquor we never make anything of.

Re-examined by Mr. SOMERSET: We are getting 15s. for the local sale of coke, for what we send out 13s. 6d. There is a ready sale for it.

By the COMMITTEE: We made about 8 million feet of gas last year. If the bill passes we shall have ample funds to provide all requirements for gas and water. We shall be liable to penalties for any deficiency or for any want of pressure.

FRIDAY, MARCH 14.

Mr. GRANVILLE SOMERSET stated that in consequence of the view suggested by the committee the promoters were prepared to produce clauses at the proper time which they trusted would meet with approval. With regard to Mr. Hanbury Leigh's trustees, it was agreed that certain limits, which were shown on the map, should be excluded from this bill, and it was further arranged that the company should not take water from any of the springs in larger pipes than those now used. In order to satisfy the committee and his learned friends, who appeared for the petitioners, he would put Mr. Hair again into the box for the purpose of his being cross-examined on these points.

Mr. *Hair* was then recalled, and confirmed the statement of the learned counsel for the promoters as to the modifying clauses proposed to be inserted in the bill to meet the requirements of the opposing petitioners.

In cross-examination by Mr. STEPHENS, *witness* admitted that, with regard to two out of the three springs, there had been no gaugings taken, but believed that the middle spring would produce at least double the quantity of the upper spring, and the lower spring three times as much. In the bill the promoters had proceeded upon that assumption, and it was on that basis that his evidence had been given before the committee on the previous day. The pipes now in use were of two sizes—6 inches and 10 inches. The company were willing to be bound down to use those pipes in both cases and no larger pipes. The difference of level between the upper springs and the reservoir was about 80 feet. The existing pipes would convey three times the present quantity of water. The reason for the completion of the reservoir after a lapse of 22 years, during which its want had not been felt, was that the company proposed to supply a considerable additional district. A great part of that district had now been agreed to be struck out. The distance from the upper spring to Pontypool was about four or five miles. The company did not propose to supply the hill on the opposite side to Pontypool. It could not be done without a separate conduit, and the houses were situated so high up the hill that it was next to impossible. Although the houses at this part of the hill were only about a mile and a half from the spring, it was proposed to send the water down the valley four or five miles away. The price charged was higher than at Abergavenny, for the reason that the Abergavenny works were constructed by the ratepayers, and this was a proprietary company. He did not know the rates at Monmouth. The Pontypool prices were under those at Blaenavon, which was not a very difficult district. He had no correct figures, but he believed the population of Blaenavon, according to the last census, was about 9000. He was not aware of the amount of money spent on those works. At Merthyr the works were constructed either from the rates or by money borrowed on the rates, and they might therefore be lower than those at Pontypool. He was not aware that the rates at Newport were below those proposed by this bill; but Newport bore no comparison with Pontypool, because Newport was a very populous place, and had a large number of houses situated closely together. With regard to places like Abergavenny, if the works were destroyed to-morrow the ratepayers would have to bear the loss, whereas, if such an accident happened to this company, the company would have to replace the works out of their own pockets.

Re-examined by Mr. SOMERSET: I have been at the works since 1855. There have been very few complaints as to the water. As a sensible man, I should hardly advise the company to go to unnecessary expense. Abergavenny is a more concentrated town than Pontypool. There is the advantage there of the water going directly from the springs to the consumer without seeing the light. It is all covered in, and it is impossible to get it contaminated with anything. Water exposed in an open reservoir can never be so good as water drawn from the spring-head. In coming to Parliament it was considered right

that we should take the precaution of having powers to make a reservoir, and that is why we put it into our bill. We were occupied possibly a couple or three hours in the gaugings made in 1865. They were not made for the purpose of this bill. The springs have never diminished in quantity to my knowledge since then, and I was informed that those gaugings were lower than in any previous year.

The CHAIRMAN inquired in what position the capital of the company stood as to the limitation of dividends. He understood the limitation of 10 per cent. only extended to £13,000.

Mr. SOMERSET stated that the £26,400 was under the General Act.

Mr. BONHAM-CARTER asked what was the population already supplied with water.

Witness said it was probably about 10,000. There had only been a scarcity of water in one or two particular seasons, and on those occasions the only inconvenience was that the company had to turn the water off from a portion of the town during the night, so as to retain a sufficient supply for the next day. All that was required for the reservoir was to make the bottom water-tight, and that would give a storeage of 4½ million gallons. The daily supply necessary was 240,000 gallons.

Mr. *William Macintosh* said he was the superintendent of the Monmouthshire police at Pontypool. He had been there for eleven years, and during that period had been supplied with water by the water company. It appeared to be clear and good, and he had never heard any complaints. The police station and town-hall were also supplied by this company with gas, and he had no reason to complain of the quality of gas supplied since the present company had come into possession. At the request of the last witness he went with him to the town fountain, which was an open drinking fountain near the town-hall. He took four bottles of water from it, and corked and sealed the bottles, and handed them to Dr. Whitmore for analysis. Those were the bottles now produced. He was also superintendent of the fire brigade, and had never had any difficulty in obtaining water in case of fire. He had heard it stated that the water was sometimes turned off in the night, but thought that could not have occurred within the last two or three years.

In cross-examination, *witness* said he had never found the water turned off when he wanted it. He did not think it ought to be at the option of a company whether they should give a constant supply or not.

Mr. SOMERSET observed that that was a matter for argument.

Dr. *John Whitmore*, of Marylebone, medical officer of health and chemical examiner of gas and water, stated that he had analyzed the four bottles of water delivered to him by Superintendent Macintosh. The water was free from colour and taste. On examination with a microscope having a magnifying power of 100 diameters, he found some particles of earthy matter and small vegetable fibres, but he could discover no living organism in the water whatever. On evaporation he found the total solid residuum to be 9·6 grains out of 70,000 grains. On subjecting that to another test, he found 1·12 grains of volatile matters. The hardness of the water amounted, before boiling, to 8 degrees; after boiling, to 5·5 degrees. The salient constituents were principally carbonate of lime, with traces of lime and soda. He believed the organic matter to have been vegetable, not animal. Having regard to these results, his opinion was that the water was much purer than ordinary drinking water, and was exceedingly well adapted for domestic purposes. Constant service was not always desirable, because a considerable quantity of water was thereby wasted. In Marylebone there was a large number of houses where there were no ball-cocks attached to the cisterns and no taps to the closets, and the consequence was that the water to a great extent only went to cleanse the drains. Of course regulations could be made by the companies so that there should not be water wasted. The quantity per head which ought to be supplied varied in different places. In London it was about 30 gallons per day for each person.

Dr. *John Davis*, surgeon and medical officer of Abersychan, also gave evidence on behalf of the company. In his district there were works employing a large number of people, and he had a great opportunity of judging of the state of health. About four years ago typhoid fever existed to a large extent. He had several bad cases to attend to, and he was very strongly impressed with the immunity from fever in the district supplied by the water of this company. It was not proposed by the bill to supply the whole of the other houses, because they were situated at too high a point.

Cross-examined: He believed it was desirable to carry the water supply as far as possible. In some of the portions unsupplied by the company, the water could only be obtained by pumping, and it was not proposed to pump. The population over which his supervision extended was about 10,000. He had not been connected with the company in any way.

Re-examined: The British Iron Company had an independent supply of water from the hill-side, which was furnished to their men. It came from their own land; and the workmen got it for nothing. That being so, it was not likely that they would be willing to pay for water if the company were prepared to supply them with it. It was entirely a question of money.

The CHAIRMAN said he understood that there was nothing to hinder the supply being given to this particular district if an agreement could be come to. The district was not excluded from the bill.

Mr. SOMERSET said he believed that almost the whole of the district, if not all, was included in the limits of the bill, but at present it was not proposed to give that supply.

The CHAIRMAN asked what was the difference of level between this district and the highest of the springs?

Mr. HAIR stated that it was very considerable, but he could not tell the exact difference.

Dr. *Verity* was next examined. He stated that he was in practice at Garndiffaith, where other water was supplied as well as that of this company, but he chose the latter in preference. There had been a sufficient quantity even in the dry seasons, and the quality was always good. He scarcely remembered it even being discoloured slightly after rain. As the last witness had stated, it was a matter of remark very strongly that in those parts supplied with this company's water, there were no cases of fever, but in the other parts there were several cases. He was of opinion that a bill securing to Pontypool a continuation of this supply was advantageous.

Cross-examined: He had been asked to attend before the committee to speak of the quality of the water, and he was an advocate for extending the supply of the company. He had not made any calculations as to the quantity per head which the company was bound to supply under the provisions of the bill, but he knew that the quantity was large, and believed it to be sufficient.

Mr. *William Wood*, chemist and druggist for thirty years in Pontypool, stated that he had taken the water of this company from the commencement of its formation, and considered it to be very good. Sometimes there was more than was really required. He had taken the gas of the company during the past year, and, generally speaking, it was good in quantity and quality, and he was satisfied as to the price. Upon the whole the water was very clear.

Mr. *Henry Day*, inspector on the Monmouthshire Railway, at Pontypool, stated that he used the water of this company as a private consumer, and found it very good. The railway company used a great quantity of gas. There were 20 lights at the Pontypool station. He considered the quality to be very fair under the present company, but under the old proprietors it was very indifferent. The Pontypool water was much superior to that of Newport. Locomotives required very pure water.

Cross-examined: He did not know that the railway company had a leaning towards the water company. There was an arrangement made at first that the railway company should pay so much a year for the water, but the water company thought an excessive quantity of water was being used, and after an interview between the officials, it was agreed that the water should be paid for by meter. He could not say whether the result of that was that the railway company now paid less or more than the water company previously wished to charge.

Mr. *Hartley Feather*, master of the Pontypool Union Workhouse, stated that the workhouse, which was situated some little distance from the town, had a pipe specially laid down for the supply of the company's water. It was paid for by meter, and was very good in quality. Before taking that water they were dependent upon a small spring on some neighbouring premises. There were 140 or 150 people always in the house.

Cross-examined: He could not tell what the distance was between the Union and the source of supply, and had never seen the spring from which the water was obtained. He believed it to be about five or six miles from Pontypool.

Mr. *Thomas Steele*, civil engineer, of Newport, said he had turned his attention for many years to gas and water works. He had made himself acquainted with the present means of water supply at Pontypool, and considered what was proposed to be done by this bill. He thought 15 gallons per head per day was a very liberal supply for a place of that kind, but he understood that it was proposed by the bill to give 20 gallons. The springs yielded, according to the gaugings taken in the driest seasons, 249,200 gallons a day. The present pipes would carry three or four times the quantity now supplied to the town. As an engineer, he thought that it was very desirable to have a reservoir, so that there should be no cessation in the supply at special times, but he did not believe it would be actually required. It would only cost about £2500. The petitioners alleged that it was proposed by the bill to charge too high a rate, and amongst other things, suggested that the company should only be allowed to charge according to the rateable value of property, instead of the rack-rent; but it was the usual practice to charge upon the rack-rent. An alteration would make a considerable difference against the company. The rates proposed were very moderate, considering the terms of other water companies. He had erected gas-works at several places in the neighbourhood of Pontypool, and been generally acquainted with this company's works for a considerable time, and had examined them specially for the purpose of this bill. Considering the size of the town the works were now superior to those of most other towns in the neighbourhood. The maximum price proposed—viz., 6s. per 1000, was very low under the circumstances.

Cross-examined: He believed the present price of gas at Pontypool was 5s., but could not say if it had been more than that up to within a recent period. The reservoir was not wanted at all except as a safeguard. He should recommend the formation of two filter-beds. I think the bill provides for an increase of 1500, which is ample. It is important that the company should get the powers they seek. In Abergavenny the commissioners took the old gas-works at an unusually low rate, and the quality of gas supplied was only 12 candles instead of 14. The difference would amount to about 3d. a candle. The gas-works are carried on under the rates just as the water-works are.

Mr. *John T. Cocker*, manager of the Merthyr Tydvil Gas-Works, said he had had altogether about 30 years experience, and was consulted by the Pontypool Company before they took possession of the gas-works. The works were then in a very insufficient state, and were purchased for £11,000 on his advice, after a structural valuation and a consideration of the vested interests, freehold land, &c. The company abandoned portions of the old works and reconstructed others upon a very different scale. He had observed the illuminating power of the gas, though he had not actually tested it, and believed it to be very good. Six shillings per 1000 was very reasonable as the maximum rate, considering the price of coals and the maximum price allowed to be charged for gas in other localities, at times when coal was not nearly so dear as it was now. Coal had never been so high in price before, in his remembrance. At the Carmarthen works the maximum was 4s. 6d. by the Act of Parliament, and the result was that they could not pay a dividend; in fact, he believed that this year they had lost on the working. At Newport the maximum was either 3s. 4d. or 3s. 6d., but the actual price charged was higher. With regard to those works he was informed that a very favourable contract for coals had been entered into before the rise in price took place. Besides that, Newport was a much larger and more populous place than Pontypool, and the circumstances were very different. Merthyr had also a large population, and gas could be made much cheaper there than at Pontypool. He knew nothing of Abergavenny beyond the fact that the works were not in the hands of a company there.

Cross-examined: If the price of coals went down suddenly to the natural level there was nothing in the bill to bind the company to a similar reduction in the price of gas, but in any case they could not go beyond 6s. per 1000 feet. After the maximum dividend is paid the price must be reduced.

Mr. STEPHENS: Then you think the price ought to be fixed with a view to your getting your 10 per cent. on the original stock as soon as possible?

The CHAIRMAN: Is there any precedent for separating the gas-works from the water-works, because we might be prepared to grant the one and not the other?

Mr. SOMERSET said he was not aware of any, but when it came to his turn to address the committee he should devote a few remarks to that subject.

Cross-examination continued: He considered the public would be benefited and protected by the bill becoming law. He could not consider a more fortunate state of things than the passing of a bill which while it benefited the company protected the public. It appeared to him to be unnecessary to discuss such a question. He had had every opportunity of making himself acquainted with the state of the works and the business when he advised the company to purchase the works.

Mr. SOMERSET remarked that as some difficulty seemed to have arisen in regard to the way in which Mr. Hair had estimated the quantity of water derived from the springs, he was anxious to call witnesses upon that point if the committee thought it necessary.

The CHAIRMAN intimated that the committee were quite satisfied as to that.

Mr. SOMERSET said that being so he would offer no further evidence.

Mr. STEPHENS asked for the terms of the arrangement which the promoters were willing to make with the petitioners, because it might be that, although the general principle of the arrangement was satisfactory, the details would cause a difference of opinion. There were millowners and landowners largely interested who might be incapacitated from carrying on their business if the bill was passed in its present shape.

Mr. SOMERSET urged that his learned friend had put himself entirely out of court by admitting that the principle of the arrangement was acceptable, and that the only possible difference which could arise would be upon the actual wording of the clauses, which clauses could not be taken into consideration until after the passing of the preamble.

After some conversation on the point,

Mr. STEPHENS said he would call his witnesses before making his address.

Mr. *John Harris Connolly* said he resided at Abergavenny, and was one of the Improvement Commissioners, and senior partner and manager of the firm of Connolly Brothers. He had taken a strong interest in the matters affected by this bill, and was a member of the Gas Committee. The price of gas in Abergavenny was 4s. 6d. per 1000. The coal used in its manufacture was obtained at 18s. per ton. Abergavenny was about ten miles from Pontypool. The coke was sold at a good price, and a great deal more could easily be disposed of. There were 10 per cent. profits made on the working of the concern, without

any addition to the rates. It was true that a good contract for coal had been made some time ago, but there was no difficulty whatever in making it.

In cross-examination, *witness* admitted that he had no practical experience in the management of gas-works.

Mr. *John Hamore*, member of the Pontypool Local Board, said he used in the course of a year a considerable quantity of water supplied by this company. His house was situated within a few hundred yards of the water-main, but he did not get a constant supply in the summer months; in fact there had been considerable inconvenience occasioned in that way. In rainy weather the water was muddy. He was not a water drinker. His water-pipe had been stopped up on two occasions through solid substances having got into it. He had visited the water-works, and found frogs in the water. There was a well upon his premises, but the water from that was rather hard. He would not say that the company's water was better than that, but it was softer and more useful for making tea.

Cross-examined: He was rated at £70, but that included several small cottages of £5 or £6 a year. He did not know why the local board did not petition against the bill. He was a member, but he did not bring the matter before his colleagues. His silence was not due to his knowledge that the board was in favour of the bill. It was not spoken of.

Mr. *Thomas Fletcher* said he resided at Pontypool, and was of independent means. He was the proprietor of a considerable quantity of cottage property, and was rated at somewhere over £400. He paid all the water charges in respect to that property, and was a private consumer also. There was a pretty regular supply of water for the cottages, but not for his own residence. He agreed that the quality of the water, as stated by previous witnesses, was generally good, but in wet weather it was not so. There was no filtration. It just ran into the pipe, and ran out of it. To satisfy his own mind, he traced the supply to one of the points where it entered the pipe, and found that, with the exception of a piece of perforated zinc, there was nothing to prevent things from getting into it. There had been other things besides frogs discovered in the water. He also purchased gas of the company for his own consumption. Good coal could be bought at Pontypool for 17s. a ton, including carriage. He had full opportunity of knowing the feeling of the people of the town on the subject of this bill, and knew it to be diametrically opposed to it in every sense of the word. He was not engaged in any manufacture, and the price he had mentioned in regard to coal was the mere ordinary retail price—not wholesale. I do not think there will be any improvement in the present state of things if the bill is passed. We are satisfied with the present state of things with reference to the water in fine weather, but not in rainy weather; but we want a filter and a reservoir.

Mr. SOMERSET: We will give you that. What else?

Witness: We want rateable value as the basis on which the charge for the supply of water shall be made.

Mr. SOMERSET: Well, in point of fact, you want the bill. What is the fault about the gas?

Witness: The price, which we think should be from 4s. 6d. to 5s., according to the price of coals.

Mr. SOMERSET: Your reason for lowering the price of gas is that you pay 17s. per ton for coal, which may or may not be gas coal. Is that the only reason for complaining about the gas?

Witness: I object to the monopoly in the town. At present any other company can start and break up the streets, and do anything they like by permission of the local board. I should think so.

Mr. SOMERSET: But at this moment there really is a monopoly. There is only one company. If the bill passes, there will be still one company. Where is the change for the worse?

Witness: Because it shuts the door against any other company starting. Neither the board nor the parishioners can start fresh works if the bill is passed.

Re-examined by Mr. STEPHENS: If there is a gas company under an Act of Parliament in a district, the local board must buy it up before commencing a new undertaking. He regarded the reservoir as necessary, but nothing had been done with it for 22 years. He was apprehensive that if the bill were passed, the town would be in a worse plight than it was at present. He objected to the fixing by an Act of Parliament of a high gas-rate. It was the feeling of the district that this was not a bill framed with due regard to local interests, and this was the reason of the opposition.

The CHAIRMAN said he would merely throw out the suggestion that, in case the bill were passed, there ought to be some further security given to the public for the proper discharge, by the company, of their functions.

MONDAY, MARCH 17.

Mr. *Samuel Harpur*, examined by Mr. STEPHENS.

I am a civil engineer, and engineer and surveyor to the Merthyr Tydvil Local Board. I have been many years manager of the Merthyr Water-Works. I have been concerned practically in the construction of water-works, some of which were on a large scale. I have also had to prepare plans and drawings of works for filtering water in the vicinity of the proposed works. I have inspected the promoters present works, and found them to consist only of a system of pipes and of a reservoir which is never used. Beyond the reservoir is a 3-inch pipe running alongside the brook, and connected with a little tank. It was fitted with a small piece of perforated zinc, about 2 feet by 8 inches, which was covered with weeds. The masonry beneath the zinc had very open joints, so that insects could easily pass into the water. Below the zinc there was running as much water as a 3-inch pipe would carry. Some of the fields in the vicinity, from which the surface water had run into the brook, had been manured. That was above the opening of the pipe, and there was nothing to prevent the water from the manured field from entering the pipe. I have a general knowledge of the population and district which this bill includes. In the upper parts of the district within the limits of this bill there is a population of about 5000, which this bill does not contemplate supplying. Those people ought to be supplied. The company should make provision for supplying at least 16,000 at the present time. That number of people would require 320,000 gallons a day, allowing 20 gallons a head, which is a moderate quantity. The consumption during a portion of the 24 hours would be more rapid than during the remainder. Half the quantity consumed would be used in the six hours from nine in the morning to three in the afternoon. I made a calculation as to the yield of the springs according to the evidence given by Mr. Hare. Taking his evidence, the minimum yield would be 180,000 gallons a day. He estimated that the upper spring yielded 30,000 gallons, the middle spring double that quantity, which would be 60,000, and the lower spring treble that quantity, which would be 90,000, making together 180,000.

By the COMMITTEE: The 16,000 population that I say should be supplied includes the 4000 people in the upper parts.

By Mr. STEPHENS: Taking the yield at 120,000 gallons, under present arrangements—that is, without a reservoir—only two-thirds of the population could be supplied; because, for eight hours in the night, the pipes would be full, and the stream would be running past, so that you could secure only two-thirds of the 120,000. I suggest decidedly that the present arrangements should be supplemented by some provision for storeage. Storeage should be provided for 140,000 per day for 40 days, which would be 5,600,000 gallons. I think the existing reservoir may be made water-tight and be sufficiently enlarged to hold that quantity of water for £2000. From the samples of the water which I have seen, I think it is decidedly necessary to filter it.

Mr. SOMERSET: I do not want to stop my learned friend, but, after what the chairman was kind enough to say on Friday night, I told my clients what I told them, in fact, ten days ago, that they would have to bring in a clause for filtering.

The CHAIRMAN: I threw out a hint that a reservoir and filter would be required for this water. It seems that water is required in the place, and that it should be under some statutory control. They have got nearly all the water they can, and the question is as to the storeage of the water and the filtering.

Mr. SOMERSET: We have permissive powers to make a reservoir and filter-beds. What we shall present to you, if we have the opportunity, is turning the clause into a compulsory one.

Mr. STEPHENS: Then I shall take that point as settled. The only other question which I think material is as to the size of the reservoir and filter-beds.

Witness: For any increase of population beyond 16,000 further storeage should be provided. About 500 superficial yards of filter-beds ought to be provided. Two beds would be required. I estimate the total cost of those filter-beds at £750. An additional filtering area would be required for an increase of population over 16,000. I think the reservoir accommodation which I have recommended will be adapted to the whole of the springs. It ought to be so adapted. At Merthyr the water-rate is assessed on the rateable value of the houses. That is what we interpret "annual value" to mean. The board fixed that as the meaning.

Cross-examined by Mr. SOMERSET: I have nothing to say against the bill. I have been several times over the district of Pontypool for the purpose of examining the water-works, and previously to examine the sewage works. I know the population you ought to supply from information I have obtained in London from Mr. Conway. I gauged the yield of the middle spring the week before last, and found it running 430,000 gallons a day. The upper spring ran 115,000 gallons a day. The lower spring I estimate at 453 gallons a day, but I could not gauge it, for it is out of sight.

Re-examined: The calculation as to the yield relates to the total yield during the present wet weather. It has nothing to do with the minimum yield of summer.

By the COMMITTEE: The upper population can only be supplied by pumping. In Merthyr we have a population of 16,000 for which we pump the water. It is not a very expensive process. I have calculated that it would cost £240 a year to pump 20 gallons a day for the 5000 people to a height of 300 feet. I believe the annual revenue from that population would be £400.

Mr. *William Conway*, examined by Mr. STEPHENS.

He was a member of the Pontypool Local Board. He was engaged in the manufacture of mineral water, and was also a member of the firm of Conway Brothers, tin-plate workers. Had taken the population of Pontypool from the census returns. The population of the lighting district, denominated under the census, "The Local Board District," was 4884. The number of inhabited houses was 942; uninhabited, 35. The whole population of Trevethin parish in 1871 was 20,650. The number of inhabited houses was 3948. The population in 1861 was 18,146. That showed an increase of 2500 in ten years, whereas it had been stated in the committee that there was an increase of only 1000 in 20 years. The population of Ponteague was 2761. It had slightly decreased since 1861 in consequence of the stoppage of some works. It was at present supplied by wells and pumps. It was not all within the limits of this bill. The population needing to be supplied by this bill was about 16,000. This bill had not been very much discussed, but he did not know why. When he first heard of it, he applied at a meeting of the local board for a copy of the bill, but some delay occurred, and it became too late for the board to take action. He believed that a majority of the board consisted of shareholders in the gas and water company. The provisions in this bill as to the charges for water to manufacturers were most unsatisfactory. The bill said that the charge shall be such as shall be agreed upon between the company and the consumer. That meant that if the consumer did not agree to the terms, he would be without water. The company would have power to charge a ruinous price to traders, and the latter would have no remedy. The opponents had only two days to organize and to get up their petition. They obtained 175 signatures, and could have got five times as many if they had had more time.

Mr. SOMERSET said that in no bill of this kind was a company obliged to supply water for trade purposes, and trade rates were never inserted. They were always a matter of agreement.

Cross-examined by Mr. SOMERSET: We originated this movement by convening a committee of the inhabitants to discuss the bill. There would have been no difficulty in obtaining ten times as many signatures as we have, if time had permitted. There is a very fine spring of water in the district, nearer the works than the supply, which is included in the bill. It is the finest spring in the whole district. I am not aware that this company has tried to purchase it, but been unable to get it for money. There are other springs running down the range of mountains towards Newport. I do not mean to say that there is any place where the company can get water for nothing.

Re-examined by Mr. STEPHENS: There has been a strong desire on the part of the local board to become possessed of the water-works as a sanitary measure. I believe that if this bill is rejected a better bill for the locality could be framed.

By the COMMITTEE: The rateable value of the whole of Trevethin parish is £43,184. The rateable value of the property held by the petitioners is about £4500. The rateable value of the lighting district is 11,697. Coal has been raised recently from 17s. to 20s. per ton. I am quite sure it is not going to remain at that price. There is no difficulty in getting a supply of the gas coal for twelve months at 16s. a ton. There is an attempt on the part of the gas company to create a *furore* about the price of coal.

Mr. *G. W. Stevenson*, examined by Mr. STEPHENS.

I know the position of the Pontypool Gas-Works. They occupy what would be considered a favourable position for making and distributing gas. They are close to the railway. I have heard most of the evidence for and against the bill, and have made an estimate of the cost to the company of gas per 1000 feet at the consumers meters, supposing the sale to be 8 million feet a year, and that the company make 7500 feet from every ton of coal that they carbonize. That is about what they would do. I have then taken the tonnage of coal at 19s., and deducted the value of the residual products. The net cost for coal alone I have taken at 20½d. Then I have taken purifying materials, wages, and manufacture, repairs, maintenance, and distribution, salaries, and general charges, at 20⅝d. The whole require to be added to the 20½d., making together 41⅛d., or 3s. 5¼d., as the net cost to the company of gas at the consumer's meter. As they are now charging 5s. per 1000 feet, that leaves 1s. 6¾d. for profit, which would pay 5⅜ per cent. upon the £11,000 of capital. I may say that generally one-third of the selling price goes for coal, one-third for manufacture, and one-third for profit. That is a very fair rule to take, and it applies exactly in this case. In my calculation I have put the price of coal at 19s., which was the price given in the evidence for the promoters. But if, as stated in the evidence given for the petitioners, coal is obtainable at 15s., the company would be working uneconomically in using coal at 19s., and the consumers ought not to bear the loss of such uneconomical working. The lower price would enable 6d. per 1000 feet to be added to the profit, and enable the company to pay a dividend of 8 per cent. on the £11,000. I think 5s. is a very fair maximum price to put on the bill, because coal is now at the very highest point it has ever reached, and it is quite certain that if it long maintains anything like its present price, it must seriously interfere with the industry of the country, and then it must come down enormously, though perhaps not so rapidly as it rose, nor to so low a price as it had before. It has been stated that £4000 has been expended on the improvement of the works during the last twelve months. That sum ought to come out of the £11,000 to be paid for the works, because

the works ought to be handed over in good going order. £11,000 is an enormous sum to pay for works that make only 11 million feet a year. If the capital is swollen by an unnecessary sum, that would be a reason for reduced dividend. Wherever a company employs a larger amount of capital than is fair and legitimate, the company ought to be satisfied with a reduced rate of dividend. The consumer ought not to suffer in consequence. From £7000 to £8000 would more than suffice to construct works with all the mains, services, meters, and working capital, necessary to do more business than this company is now doing. A thousand pounds for a million feet of gas sold is a very large expenditure indeed. Pontypool is in the very centre of the coal-field. A maximum of 6s. for the gas is not at all fair to the locality and the consumers. I am quite content to use red ash or brush coal for gas purposes. I pay 14s. for it on board at Newport. I do not mix it with other coal, but use it pure and simple. It makes a very good gas, but not a very hard coke. I think the grounds of the opposition to the bill are reasonable. Every shilling in the price of coal represents 1½d. per 1000 feet in the price of gas.

Cross-examined by Mr. SOMERSET: I buy coal very largely for gas purposes. I purchase nearly 10,000 tons a year.

Mr. STEPHENS summed up the evidence on behalf of the promoters. He said that the first consideration in reference to a gas or water bill was what were the objects it proposed to accomplish. If the district to be served was wholly unprovided with either gas or water, no doubt the committee would listen with favour to the bill; but if those facilities had already existed in the district, and the bill was merely one to confer statutory powers without any great alteration of the supply, a very close examination of the circumstances was most certainly invited. If ever there was a company which should come with a mature and complete scheme it was the present one. It or its immediate predecessors had existed for 22 years as a water company, and for many more years than that as a gas company, and they had before them the accumulated experience of more than a quarter of a century. Was this a complete scheme? There had been some difficulty in getting to know what the works really were. In the deposited plans they had represented the reservoir filled with water as a going concern. Water-works, in the ordinary sense of the term, there were none. The water was taken from a spring, run into a pipe at one end, and run out of the pipe at the other, and on its way it was caused to flow into certain side pipes. That was all the works consisted of. Then, as to service, the promoters first said that it was constant. No doubt it was in the sense that as long as the streams were flowing the water was in the pipes; but if the water ceased to flow the supply ceased. For such a supply as this the promoters had asked, and were now insisting upon, a payment upon the rack-rent of the houses in Pontypool, as if the water was of the best quality, filtered, regular, and in every way free from objection. A good deal of what he should have had to say on the subject of the reservoir was unnecessary, because, through the intervention of the committee, the promoters had altered their bill by the insertion of compulsory provisions as to the reservoir, which provisions were not in the bill as it was laid upon the table. The company had dealt with the gas and the water merely as matters of profit, without regard to the necessity of those two things to the public of Pontypool. It was not too much to say that to the consumers both gas and water were necessaries of life. They were matters in which they were vitally concerned, and concerned in an entirely different way from the gentlemen who were merely anxious as to the profit which they could make out of the supply. On the subject of capital the committee had been kept in almost total ignorance; and even to this moment they could not have a clear, connected, definite statement as to the capital and its application. It was evident from the information which had been given by his witnesses that water-works, under the bill, would not be capable of giving an adequate and regular supply, and an important part of the population had been altogether omitted. When the promoters were dealing with the price to be charged for their gas, they had represented that any considerable reduction in the price of coal was altogether hopeless; but there was before the committee distinct evidence that suitable coal could be obtained at a much lower rate than the promoters had given; and the evidence of Mr. Stevenson went to show that, even taking their own price of 19s. for coal, a maximum of 6s. per 1000 for gas was an excessive price. Moreover, the committee were faced by this fact, that though the company had existed for a quarter of a century, it was only during a season of coal famine that they had come to Parliament to ask for parliamentary powers. They had, in fact, taken advantage of the present crisis in the hope that the committee would, at such a time, grant them a high maximum. The bill, as originally framed, was one for widening the district of the water supply; but it had been stated that in consequence of certain objections on the part of the petitioners, the agricultural district, which had been at first included, had been afterwards struck out. He had gone through the petition, and he could not find one word about the extension of the district, though he certainly found very strong objections expressed by the petitioners against the company taking water which properly belonged to the petitioners; and he could well understand that, under such circumstances, considering that the margin between the supply and the actual wants of the consumers was so very narrow, the promoters had felt it necessary to reduce the district of supply. The limitation, however, was one which they had imposed upon themselves. But, in this aspect of the matter, was the bill one which would commend itself to the favourable consideration of the committee? He ventured to think that this limitation was an additional reason in support of the view urged by the consumers that a bill professing to deal with the wants and wishes of Pontypool, but defaced by such amendments, was one which, in the interests of the inhabitants, ought to be unhesitatingly rejected by the Legislature. The bill would establish a statutory monopoly from which there would be no escape. Seeing the spirit in which the bill was brought in, the consumers were afraid to be placed at the mercy of the company, for the promoters seemed to consider that they had a right to exist in the district simply for the purpose of making as much money as they could out of those who were obliged to be their customers. None of the inhabitants or manufacturers had come forward in favour of the bill. It had been supported exclusively by the engineers and officials of the company. Looking at all the circumstances, he hoped that the committee would throw out the bill.

The room was then cleared that the committee might deliberate. Upon the readmission of the public,

The CHAIRMAN said: The committee have thought that they were in possession of the facts of the case, and need not trouble Mr. Somerset for a reply. They find the preamble of the bill proved, and they are further of opinion, and desire to intimate to the parties, that the maximum rate of gas should be 5s. 6d., and that provisions should be inserted securing the advantages of a reservoir and proper filtering apparatus for the supply of water.

Mr. SOMERSET, after consulting his clients, said that they were satisfied to accept 5s. 6d. as the maximum.

The clauses of the bill were then considered.

On clause 43, regulating the price of gas,

The CHAIRMAN said he should substitute 5s. 6d. for 6s.

Mr. STEPHENS said that he had to propose an addition to that clause. He wished to add a sliding-scale varying the price of the gas according to the price of coal, the alterations from time to time being made in accordance with warrants from the Board of Trade certifying the price of coal.

The CHAIRMAN said that the price would be subject to the General Act. The committee believed that they were doing justice in fixing 5s. 6d. as the maximum.

On clause 47, a proviso was added making the provision of a reservoir and filter-beds compulsory.

Mr. SOMERSET proposed clause 47A: "Provided also that such reservoir and proper and sufficient filter-beds shall be completed within five years from the passing of this Act."

Mr. STEPHENS: We object to that time altogether. If they mean to make them there can be no difficulty about it.

Mr. *Hare* was recalled as to this clause. He said that it would take at least two years to complete the existing reservoir. The work could not be done in the winter. The other side had asked that it should be completed in six months. To do that would be quite impossible. It was quite impossible on the existing land to complete the reservoir so that it would be capable of holding 5 million gallons of water; 4,500,000 was the utmost that could be held in a reservoir on the existing site. There was no more land in the possession of the company, and there were no powers in the bill to acquire further land.

The CHAIRMAN said the committee would allow two years for the construction of the reservoir, and adopt the size offered by the promoters.

At the request of Mr. Somerset, Mr. STEPHENS consented, on behalf of his clients, to allow a further period of six months.

On the question of filtering, a clause providing for sufficient filter-beds, and for the regular filtration of the water, was passed by the committee.

On clause 49, relative to supplying under constant pressure,

Mr. SOMERSET said that the object of the clause was to relieve the company from the obligation of continuing under constant pressure.

Mr. STEPHENS asked that the clause might be struck out, inasmuch as it intended to exempt the promoters from the operation of the General Act on the subject.

Mr. *Hare*, on being recalled, said that the circumstances of Pontypool were such as to entitle the company to exemption. They could not lay on a service or execute a repair if they were bound to give constant pressure. They had, however, given constant pressure, and there was an intention to continue it except during repairs, frost, or some unusual interference with the system. In case of fire it would not take five minutes to turn on the water.

Mr. STEPHENS: Are you content to leave yourselves under the General Act? And, if not, why not?

The CHAIRMAN: We could not possibly compel the company to constant pressure, and although there might be a modified clause, I really think that you must give the company some credit for intending to do right.

Mr. STEPHENS: I am prepared to substitute a clause which will allow them to turn off the water occasionally.

The committee passed the clause as it stood in the bill.

On the rating clauses,

Mr. STEPHENS said the company proposed to levy the rates upon the rack-rent. That, he contended, was unreasonable.

The committee decided to substitute the term "annual value" for "annual rent" as the basis of assessment for the water charge.

Mr. STEPHENS stated that the rates now proposed were higher than those which had been previously charged.

Mr. *Hare* was recalled, and stated that under the bill the company would give, compulsorily, more water than they had ever supplied previously. That would be a reason for a higher charge. The supply for water-closets would be given freely, whereas it had been hitherto charged for at 2s. 6d. a quarter.

After some further discussion the committee passed the rates proposed by the promoters.

As to the supply of water for trade purposes, Mr. STEPHENS called the attention of the committee to the fact that no rates were fixed by the bill. This omission left the trade supply entirely in the hands of the company, and prohibitory rates might be charged.

Mr. *Hare* proved that it was the custom to charge to traders by agreement. If the company had water to spare, and they asked prohibitory rates for it, they would suffer in their own dividend.

Mr. STEPHENS: What is your objection to putting in a clause as to the price for trade purposes?

Witness: There are many objections. We may not be able to supply the water at all to traders; and, again, I have never seen the price fixed in any Act.

The CHAIRMAN said that he should like the petitioners to show him that it was usual to fix the charge to traders. He thought that it must be left as a matter of bargain.

Mr. STEPHENS: I cannot carry it farther than to ask for a clause requiring that if the company have surplus water they should fix a sale of charges and publish it.

The CHAIRMAN: I think it is of no use for you to press us, Mr. Stephens.

The bill, as amended, was then passed.

TUESDAY, MARCH 18.

TENBY WATER BILL.

Mr. MICHAEL and Mr. THOMAS appeared for the promoters; Mr. RODWELL, Q.C., the Hon. Mr. THESIGER, and Mr. MANSELL JONES on behalf of the Town Council of Tenby, petitioners against the bill.

Mr. MICHAEL opened the promoters case. He said Tenby was a watering-place of considerable attractions, situated on the western side of Carmarthen Bay, in the Bristol Channel. The town had very largely increased, for whereas in 1801 the population was 984, in 1851 it had risen to 2981, and in 1871 to 3810. The bill proposed to give a water supply to Tenby, which had a municipal corporation, and also to take in an outlying portion of considerable importance, the parish of Penally, which would add about 450 inhabitants, making a total population of about 4270 within the limits of the bill. The rateable value in 1871 was somewhere about £11,000, but since then it must have considerably increased. The watershed of the supply now given by the corporation to the town was 150 acres, situated at an elevation of 33 feet above the doorstep of the Gate House Hotel, which would form a useful datum line in estimating the height of the water at the various points of supply. Tenby being at the sea-side had its population at least doubled during the summer months, so that they had to provide at the present time for a population of at least 8000 persons. But they had gone further than that, and, lo king at the rate of increase, had calculated to provide works that would supply 15,000 people with 20 gallons per head per diem. In 1870 the sanitary condition of Tenby was such that the Privy Council sent down Dr. Radcliffe to make inquiries as to the cause of various attacks of fever which had been prevalent in the district, and he reported that the mortality in the district arose from an outbreak of enteric fever. He further reported that the water supply by works under the control of the local board was insufficient for the requirements of a water-closet system such as that which was adopted in the town and suburbs; that two of the sources from which the public supply was at present taken—the Hollybush springs and the Ladywell spring—were liable to pollution, and recommended that measures should be taken to augment largely the supply of water for the town. That report was made in 1870, and from that time to this no steps had been taken to increase the supply. He was bound to say that the corporation continually sought out additional sources of supply, and continually received reports from all kinds of persons, the misfortune being that, having received the reports, they furnished matter for discussion in the meetings of the Local Board of Health, but nothing was done. The present supply of the town came from three sources. First, there was a reservoir placed in the Dingle, with a watershed of 150 acres; then there was the Ladywell spring, which was a valuable spring, but from which the Pembroke and Tenby Railway Company had the right of abstracting an indefinite

quantity, if not the whole of the water, and they in fact only allowed the surplus of the water to flow through a 4-inch pipe into the reservoir. Besides that an adit had been driven, and a considerable sum of money expended, with very little result. The supply was so notoriously inadequate to the wants of the town that in 1871 the corporation employed two engineers to inspect and report upon the district in order to advise the corporation as to what means should be taken to better the supply. The engineers, Messrs. Shelford and Robinson, thoroughly investigated the district, reported upon all the sources of supply, and recommended the council to supplement their present supply by the use of the St. Florence spring, the same water as that proposed under the powers of this bill to be brought into the town. That water was proposed to be pumped into a reservoir 66 feet above the height of the datum line, and was at a sufficient height to supply the whole of the houses in Tenby except one property called the Northcliffe property. At present there were no houses there, but it was intended to be laid out as a building site. The engineer proposed to get rid of any difficulty on that score by pumping direct into the mains. Messrs. Shelford and Robinson stated in their report: "Having carefully considered these sources of supply, we advise the adoption of the pumping scheme upon the St. Florence Brook, and are of opinion that it is infinitely the best, both as regards the present outlay and as far as regards the future wants of the town." They further stated that for an expenditure of £2500 an abundant supply could be obtained. The estimate for the proposed scheme was £5800. The difference between the two estimates arose in this way: that Messrs. Shelford and Robinson contemplated taking this water directly into the reservoir of the local board, but the promoters thought it better while they were about it to have it pumped up to a considerable elevation, and therefore to incur further expense. Nothing followed on the report of the engineers except the discussion, which, according to the reports in the newspapers, took place on every scheme. In September, 1872, the corporation being much pressed by parties from without as to the necessity of providing a better supply for Tenby, and being unwilling themselves to undertake the trouble and cost of providing a supplementary supply, passed a resolution, inviting persons to form a public company for the purpose of supplying the town, and promising that public company all the support in their power in order to obtain an Act of Parliament conferring the necessary powers. They then caused an advertisement to be inserted in the public newspapers, calling upon parties to come forward to their aid in establishing a company and augmenting the present supply. Immediately under that advertisement appeared another advertisement, from an alderman of the borough, inviting parties to come forward and join him in establishing a private company. Nothing whatever came of that, and no steps were taken in consequence of that advertisement until the present promoters, gentlemen of large wealth, very largely interested in the prosperity of Tenby, and feeling deeply that the want of water prevented the prosperity of the town, came forward to promote this bill. He was quite sure not one word could be said as to the position which these gentlemen occupy in the district; they were gentlemen of large wealth, and were very largely interested in everything concerning the prosperity of the town. Shortly before the November elections the Town Council seemed to have changed their views, and they attempted to rescind their previous resolution. Some time after the election a meeting was called in order to have an expression of the feeling of the inhabitants as to the provisions of the bill. That merely passed off without any definite expression of opinion, but the Town Council passed a resolution that the bill should be opposed. An Act was passed last session by which proceedings in the future as to promotion and opposition to bills in Parliament was to be regulated, and it now became necessary, before borough funds could be expended in opposition to any measure in Parliament, that there should be an absolute majority of the members of the council voting that the bill should be opposed, and that a meeting should be subsequently held, a meeting of the ratepayers convened by public advertisement, and that only, should affirm the resolution of the Town Council. Such a meeting was held on the 11th of February, and a resolution was carried that the bill should not be opposed. A poll of the parish was taken, and the result was a reaffirmation on the part of the ratepayers that the bill should not be opposed in Parliament. But still the corporation were here to oppose. It was the first case which had arisen of the kind. He could not say it was a case of *locus standi*, but he said that his friends who were representing the corporation were here in wrong of the corporation. The fact was that the mayor was against this opposition, three out of four aldermen were against it, and a majority of the burgesses were against it. How then could it be said that the mayor, aldermen, and burgesses were represented under the common seal affixed to the petition?

Mr. RODWELL: The majority of the common council were opposed to it.

Mr. MICHAEL said new circumstances necessitated new courses of procedure, and this was the first time this case had occurred. He could not argue that the corporation had no *locus standi* to appear here, but had they not lost their right by appealing to the burgesses, who said they should not appear?

Mr. RODWELL: They did not say that; they only said they would not pay for the opposition.

Mr. MICHAEL said the object and intention on the face of the Act was as to the application of the borough funds, but the question that really came before the burgesses was, should they or should they not oppose this bill?

The CHAIRMAN: The petition is referred to me by the referees as the petition of the mayor, aldermen, and burgesses, and they had a *locus standi*. Of course, according to your statement, the allegation is not correct, because it is not the petition of the mayor, aldermen, and burgesses, but only of the mayor and aldermen.

Mr. MICHAEL said it was not the petition of the mayor and aldermen. He could not for a moment argue that the corporation had not the fullest *locus standi* to appear, but they were not here. Their seal appeared on the petition, but it was not the petition of the corporation.

The CHAIRMAN: Their petition is referred to me. It should have been objected to before the referees.

Mr. MICHAEL said, in order to show with what *bona fides* the promoters were acting in the matter, and in order to save the corporation the possibility of any loss accruing, they bound themselves by a clause to purchase, at some price to be determined by the corporation, the whole of the property already existing and belonging to the corporation; and moreover they engaged that at any time within ten years from the passing of the bill the corporation might avail themselves of the works so constructed. The corporation in their petition stated that water of a superior quality was at present supplied by gravitation, and the supply was sufficient in quantity till the summer of 1870, when from unusual drought and leakage from works there was a temporary deficiency. Now the fact was that water-works were constructed not for winter time, but to make adequate storeage in order that in times of drought there should be no want, and here the corporation themselves confessed that in 1870 there was a temporary deficiency. They said they were taking the necessary steps to supply water, but if they were doing so it was in express contravention of their own resolution. They also alleged that the source whence the water was proposed to be taken under the powers of the bill was ill-chosen and inadequate, and that the water was impure and of inferior quality; that the height of the proposed reservoir was not sufficient to supply some parts of the town; that the estimated expense was extravagant, and the rates proposed excessive. On the part of the promoters, they were quite willing that the corporation should themselves take up the bill, or they were perfectly willing to make the bill suspensory—that was, that there should be a period in suspense during which the Act might come into operation—that supposing the Town Council carried out works adequately to supply Tenby within a certain specified time, the Act should not come into operation. Secondly, they were willing to purchase the works of the corporation; or thirdly, if the corporation wished it, they might purchase the works of the promoters.

Mr. *Stokes*, deputy town-clerk of Tenby, examined by Mr. MICHAEL.

Witness produced the minute-books of the Town Council. The resolution of the 13th of September, 1872, was—"That the council do take steps by due publicity to invite a public company to conduct the required supplementary water-works to provide the town with a plentiful and continuous supply of good water, the water rates being legally assigned to such company, the said company taking over the existing works at a due valuation, and the council exercising all necessary supervision in arranging the details involved in such transactions in order that the interests of the ratepayers may be efficiently protected." That was carried by a majority of one, and was inserted in the newspapers. On the 25th of October it was proposed that the resolution should be rescinded, but the proposition was lost. On the 3rd of February, 1873, a resolution was proposed in the Town Council to oppose the present bill, the costs of such opposition to be paid out of the rates. The resolution was carried by a majority of 9 to 5. The mayor opposed that resolution. He has resigned, but not in consequence of that resolution. He is now deputy-mayor, and presided at the next meeting. A meeting of the ratepayers was held. Mr. Wells became the mayor and chairman after the resignation of Mr. Allen. A poll was taken of the ratepayers, and the result showed—for the resolution to oppose the bill, 273; against the resolution, 281. The resolution was accordingly declared not to be carried. The promoters of the bill have addressed the mayor with reference to this bill.

Cross-examined by Mr. RODWELL: This bill was brought forward without consulting the corporation. In my opinion this supply of water as proposed by the bill would not be advantageous to the town. There is no such population or use of water in Tenby to justify the contemplated expenditure. Five per cent. on the capital would be £1000 a year. The corporation already supply water from the Ladywell, from the reservoir, and there is a certain quantity of water from an adit. The corporation are in treaty to purchase the whole freehold of the Ladywell spring to supplement our existing supply. We should be able to supply the whole of the town by gravitation; no pumping would be required. The extra expense for the additional supply which we propose is £4700, with that we shall give a better supply to the people of Tenby than they will give. The highest point in Tenby is the Northcliffe estate. The highest point from whence we can get water is the Ladywell. Mr. Allen took an active part in favour of this bill. He has a scheme called the adit, with which he hopes to supply Tenby with water. The real question with the people was the cost of opposing this bill. There are now other parties in Tenby who are putting their hands in their pockets to pay for this opposition, as the funds are not provided by the borough rate. I am the solicitor for the petitioners. They feel that if the bill is passed an unnecessary burden will be cast upon the ratepayers.

Re-examined by Mr. MICHAEL: The corporation are not efficiently protected by this bill. This company are not running hand in hand with the corporation.

The CHAIRMAN: Up to this moment has anything been done in the way of this further supply of water?

Witness: We cannot enter into contracts without the consent of the Local Government Board. We are now having plans and specifications prepared to lay before them.

The CHAIRMAN: When were those plans and specifications made?

Witness: Since this bill no actual transfer of the Ladywell spring has taken place, but the agreement has been drawn up and the deed is in the hands of counsel to prepare it. We thought we could obtain the money from the Public Works Loan Commissioners on better terms if we had the freehold of the spring in our hands than if we had merely the leasehold interest.

Mr. MICHAEL said he should contend first that no power actually exists for this urban authority to purchase lands for this purpose; and, secondly, before they could borrow one single farthing of money for this purpose they must go to the Local Government Board, who would examine into the whole matter and might withhold their consent without which not one farthing could be expended.

Witness said the corporation had power to purchase land.

The CHAIRMAN: I want to know whether there is a document in existence—the agreement for the sale of this land?

Witness: Here is a letter from Mr. Richards to the corporation, assenting to the terms upon which the corporation have had his interest in the Ladywell valued. Those documents have been laid before counsel, and the deed carrying out those intentions is now being prepared.

The CHAIRMAN: I gather from this that the purchase is a good one.

Mr. *Edward Law*, examined by Mr. THOMAS.

I am a ratepayer of Tenby, and have known it all my life. Our family have some property extending from Tenby station to Penally station, comprising about 400 acres. I do not think any one will deny that the town is insufficiently supplied with water, and there has been a great deal of grumbling about it. In the summer of 1871 water was hawked about the town, and brought in water-carts from the St. Florence Brook. The place is certainly increasing, and since the railroad the number of visitors in the summer time has greatly increased. A gentleman has taken some 90 acres of our property for building. It would certainly be an advantage to the inhabitants of Penally to have a supply of water. It is at present without the limits of the corporation supply. There is a small barracks at Penally. I have been told by my servants that people have been coming to our tank for water even last week. The present supply of water is notoriously insufficient. Building is going on very rapidly, and every one interested in the prosperity of the town would be in favour of a better supply.

Cross-examined by Mr. MANSELL JONES: The reservoirs are at present under repair. In our own house we have a sufficient supply. Mr. Davis, who has leased the 90 acres I spoke of, is one of the promoters of this bill. Penally is at present supplied with water from the red sandstone; it is built on the side of a hill. A pipe comes down from the top of the hill to supply the village.

Re-examined by Mr. THOMAS: The supply of water to Penally is derived from one pump. There is no water laid on to the houses.

Mr. *Davis*, examined by Mr. THOMAS.

I am well acquainted with Tenby. I made the Pembroke and Tenby Railway, and still hold £100,000 in it. Since the railway has been opened, there has been a considerable increase in the number of visitors to Tenby. I am one of the promoters of this bill. I have a lease of about 90 acres of foreshore between Penally and Tenby, nearly a mile in length, for the purposes of building. As to the water supply, I have always been of the opinion that it was insufficient. There should be ample water to flush the sewers as well as for domestic purposes. I know in 1870 I had some of the engines on the railway damaged for want of water. That of course was a very dry summer. The railway now gets its water from a well called Hollybush, which takes some of the water from Ladywell. We had an arrangement with the corporation; they bought the pipes, and we laid them down to Hollybush. There is no poundage, and the springs did not in 1870 yield enough water for our engines. We have the first right to the water. I had not heard of the new scheme of the corporation till this morning. The area is too small for an effective supply; I am sure it would not pay the expenses. The water question is greatly fettering my interests, and unless we get a better supply it will be no use my building on the foreshore. Tenby cannot prosper without a sufficient supply of water. I think the St. Florence scheme is the only one that can be adopted. I have always been of that opinion, and I saw that if I intended to build there I should be obliged to get the water from the St. Florence Brook. I gauged the Ladywell, and I am certain, even if it was pounded all the year round, there would not be a supply for the town.

Cross-examined by Mr. MANSELL JONES: I have not made an estimate of the

requirements of the town. I should say 20 gallons a head. I am told the population is 4000; that would be 80,000 gallons per day. I am aware that the water-works in Tenby are all in ruins. No doubt water is running to waste on the railway after all this rain. Some of the pipes on the railway were taken up because we could not make out where the water had gone to. The water was not then running to waste on account of the pipes being broken. The pipes were carefully examined. There was no water there. There are several springs called the St. Florence springs. I do not know that the main spring is close to a churchyard.

Re-examined by Mr. MICHAEL: I know where we propose to take the water at St. Florence stream. I do not know that the spot is a considerable distance above the Gomperston churchyard. The engineer can tell you that.

Mr. *Smedley*, examined by Mr. THOMAS.

I am traffic manager of the Pembroke and Tenby Railway Company, and the owner of property in Tenby. I have been there for the last 10 years, and have found great insufficiency of the water supply. It is a thing that everybody admits. In 1866 an arrangement was made for supplying the railway with pipes laid along it. The company take what water they want and the surplus goes to the corporation, they feeling that any addition made to the existing water supply was most desirable. The corporation provided the pipes, and the lessees of the railway company laid them down. The railway company require a minimum of from 15,000 to 20,000 gallons a day. If the traffic increases our water requirements will increase also. The traffic being greatest in the summer, we want most water just at the same time when, owing to an influx of visitors, there is the greatest demand for water in the town. The scarcity of water is no doubt prejudicial to the character of the town as a summer watering-place. The mayor asked me whether, as manager of the railway, we could restrict the supply of water to our engines. We gave our men strict instructions to use no more water than was absolutely necessary in fact, to assist the corporation as much as they possibly could to economize it in any way.

Cross-examined by Mr. MANSELL JONES: Each engine would take from 1000 to 1200 gallons at a time. I am not aware that the arrangement between the company and the corporation was that the railway company were to take from the corporation pipe 4000 gallons a day. Before we got this pipe we obtained water by pumping.

Re-examined: I never heard of this 4000 gallons before to-day.

Mr. *Thomas Spencer*, examined by Mr. MICHAEL.

I am an analytical chemist, and consulting chemist to a great many water companies. A specimen of water was brought to me by Mr. Sylumper, and I have analyzed it. The result of my analysis is, I find solid contents in an imperial gallon to be 21½ grains; the organic matter in the same quantity is only ·40—about two-fifths of a grain. The hardness is 19 degrees. The remarks I made in handing in this examination are that this water is colourless and without taste. It is not too hard for ordinary domestic supply, whilst the organic matter is exceedingly small; in fact, it is good and wholesome water, and well fitted for a town supply.

Cross-examined by Mr. MANSELL JONES: I saw no indication in this water of any sewage contamination. Standing a little time in a reservoir would be all that was required for it to deposit any sediment, it being river water.

Mr. JONES: May I ask you whether water coming from red sandstone is apt to be purer than that coming from a stream with a muddy bottom?

Witness: Well, that depends very much upon the level at which the river flows. If the river flows on a very small incline, the mud is quiescent as a rule; but if it rolls over it rapidly, then the mud is very soon washed away, unless it is very deep indeed—in fact, it ploughs it out.

Mr. JONES: I asked whether water from red sandstone soil is purer than water from a river of which the bottom is mud?

Witness: I should say, all other things being alike, the red sandstone water would be the purest.

Re-examined by Mr. MICHAEL: If this is red sandstone, so much the better. If there had been any sewage contamination, my tests would at once have discovered its existence in the water. The organic matter I have given is wholly vegetable.

Mr. *Sylumper*, C.E., examined by Mr. MICHAEL.

I have had considerable experience in designing and constructing water-works. Tenby is not a strange place to me. For many years I have had my attention directed to the water supply. I reside there during a portion of each year. There is an urgent necessity for an increased supply. I was first called in to advise the Town Council of Tenby in 1870. I told them that I had come to the conclusion that the valley of St. Florence was the only permanent available source from which they could obtain an adequate water supply. Nothing was done towards carrying out the advice I gave them. In September, 1872, I was requested by the council first of all to make a valuation of their existing works, and to advise them as to the easiest means of obtaining a supply for the coming summer. At that time I had no connexion whatever with the present bill, but was acting solely for the corporation. I sent in my report, in which I stated that the works and plant and reservoirs were in such a state of wreck as to render them at present utterly useless; and that as there was now an annual rent-charge of £25 to be paid for them, I was unable to place any value upon them. As to the mains and pipes, I said that these, with the exception of about 1500 yards, had been laid for 35 years, and were valueless—scarcely worth taking up for old iron, as they would be so completely eaten up by rust. The value of the pipes lately laid down, and which could be brought into use, I estimate at £400. I further stated, that although a supply from the St. Florence Valley would permanently be best and most ample, still at present I would recommend the use of a 6-inch pipe from the Ladywell laid along the railway to the town, the present pipe being insufficient. I could not recommend that as a permanent supply. The whole of the watershed of the Hollybush or Ladywell only contains 200 acres, and a watershed so small as that could not be of any permanent service to the town. Their present supply is of three kinds. The first is the Dingle, with a watershed of about 150 acres, the level above the datum of the Gate House steps being 33 feet. They have also the Ladywell, and then an adit which has been driven into the rock. I do not think that adit will furnish any supply at all. The stratification is very much contorted there, and it is very uncertain whether any supply could be obtained by boring.

Mr. MICHAEL: There are faults there, and the strata is thrown about in every direction?

Witness: It is. There is an upheaval of the limestone through the millstone grit.

Mr. MICHAEL: When you come to the St. Florence supply you come to the old red sandstone?

Witness: The old red sandstone.

Mr. MICHAEL: Therefore that, by my friend's contention, is a very good source of supply so far as surface is concerned?

Witness: Yes. There is no other place in the neighbourhood but the St. Florence fully available for a permanent water supply. Nothing was done by the corporation, and subsequently I was employed by the promoters, who, I think, are gentlemen to be entrusted with such a bill. They are gentlemen of large wealth, interested in the locality, and of high character. There is no necessity for gauging the water of the St. Florence; it is ample, and far beyond anything that could ever be required for a town four times the size of Tenby. I calculate the supply ought to give 20 gallons per head. The village of Penally is supplied with water by means of a pump. The water is not taken into the houses. Penally is a long way without the bounds of the corporation, and they could not supply it with water. I think the supply should not be less than 300,000 gallons a day, that is for 15,000 inhabitants. I have taken the population of Tenby at 3810, and Penally 468, making together 4278. Then I reckon with the summer visitors there would be a population of 8500. Taking into consideration the great increase that there has been in the population of late years, and that is sure to arise, I think a provision ought to be made for 15,000, and that is the basis on which I have made my calculations. I believe if a better water supply were provided there would be a still more rapid increase in the locality. The want has been very much felt and very much talked about. The drainage area of the St. Florence Valley is 1000 acres.

Mr. MICHAEL: We have heard something about churchyards and sewage contamination. Where is the point with respect to Gomperston at which you take your water?

Witness: At some little distance above the churchyard.

Mr. MICHAEL: Is there any possibility of that source of contamination affecting the water?

Witness: Oh, no. The site where we propose to erect our pumping-engine is considerably above the drainage of the churchyard. There is no system of sewerage that could by possibility get into our water. There is no system of sewerage existing there at all. I propose to pump the water into a reservoir which will hold about 2 million gallons, or seven days supply. In the summer months, in the driest season, the St. Florence Brook is always running. It would fill a very large pipe, I should think a 12-inch pipe. That would be more than ample for the 300,000 gallons I propose to take. The level of the reservoir would be 66 feet above the Gate House Hotel. That is just double the height of the existing reservoir. There would be no difficulty in pumping water directly into the pipes. At present they have no water for purposes of fire, and I am not aware that there is a fire-engine. My total estimate is £5800; that includes the construction of the reservoir, pumping, and the necessary laying of mains. There would be no practical engineering difficulty in connecting our mains with those of the corporation.

Mr. MICHAEL: I presume you would have to take up all these worn-out pipes.

Witness: There is no doubt that a pipe which has been laid down 35 years ought to be taken up.

Mr. MICHAEL: Does your £5800 contemplate such a supply of pipes as will be adequate for a supply of a proper character and quantity?

Witness: It does.

Cross-examined by Mr. MANSELL JONES: The height of the reservoir above the pumping-station is about 150 feet. We shall require a 12-horse power engine in constant use. I do not know the difference of the level between Ladywell and our proposed reservoir. I have no doubt Ladywell is higher; it may be 50 feet higher. The amount of capital proposed to be taken by the bill is £10,000 with £2500 borrowing powers.

Mr. *Henry Robinson*, examined by Mr. THOMAS.

I am a member of the Institute of Civil Engineers. I was consulted in 1871 by the local authorities of Tenby, and I made a long report in February of that year. I reported that there were only four possible schemes—first, by pumping in a small valley close to Tenby; secondly, by pumping from the St. Florence Valley; third, by sinking a shaft on the hill side near the existing reservoir; fourthly, by a gravitation stream from the Hollybush and Ladywell spring. Of those four schemes I considered the best to be the St. Florence Valley scheme.

This closed the promoters case.

WEDNESDAY, MARCH 19.

Mr. RODWELL proceeded to address the committee on behalf of the corporation in opposition to the bill. He said the circumstances of this case were somewhat peculiar, and he was not there on the part of the corporation to say that they were not in some little extent to blame, because if they had acted a little more vigorously, and had not allowed the difference of views which existed to stop all action on their part, the committee would not have been troubled with this bill. But at the same time the promoters of this scheme had not acted *bonâ fide* to the corporation. No doubt the corporation issued an advertisement to attract parties to give a water supply to Tenby, coupling it with certain conditions. That being so, these gentlemen at once jumped at the advertisement; they did not put themselves in communication with the corporation to arrange matters for a common scheme upon which they were both agreed, but without any communication certainly of an official character with the advertisers, they brought out this scheme. But he should ask the committee to discard all these matters, because after all the real question was, what is best for Tenby? the promoters and opponents being equally to blame, one for acting with too much reticence and the other for wanting unanimity; but that being so, what was best for Tenby? With reference to his friend's three alternatives, he certainly could not assent to this bill being made suspensory and kept hanging over the heads of the corporation. As to the suggestion that the corporation should buy the proposed works, his answer was that they were far too expensive and cumbrous for a little place like Tenby. Then as to the company buying the corporation works, terms were imposed which would be very unsatisfactory to them. This was a scheme which would cost £12,500, and was such a scheme necessary? was it necessary that there should be an Act of Parliament at all for this purpose? for what reason had public Acts been passed year after year except for enabling local governments to take the matter into their own hands and to deal with it in a cheap and summary way? There was no pretence for requiring an Act of Parliament in this case. Then another reason why these matters should be left in the hands of a corporation was, that local parties had an interest in doing everything as cheaply as they could; on the other hand the parties promoting this bill were perfect strangers, and only introduced it for the purpose of commercial enterprise. If the corporation accepted this plan, they would be involving the town in very great expense. Moreover, as was very clearly alleged in the paragraph of the petition, the question of water supply was one of the greatest possible interest to the inhabitants of a town, and the passing a bill for water supply virtually excluded any other similar measure, and might therefore have the effect of compelling a town for ever to be supplied with bad water. The other material allegations were as follows:—

That Tenby is not large enough to support or pay for two systems of water supply, and inasmuch as your petitioners works have long been in operation, and are now being utilized and augmented at considerable expense, and as the Local Government Board generally recommends the supply of such an essential as water to be under the charge of those directly responsible to consumers and ratepayers in preference to a trading company, the bill appears to your petitioners to be uncalled for and unnecessary. That while a sufficient supply of pure water can be obtained at a high level, and supplied by your petitioners by means of natural pressure, it would be a needless waste of money to provide and pump the inferior water proposed to be supplied by the promoters of the bill. That the source whence the water supply is proposed to be taken under the powers of the bill is ill chosen and inadequate, and the water is impure and of inferior quality. That the scheme of water supply proposed by the bill is defective in engineering details, ill devised, and inexpedient; the height of the proposed reservoir is not sufficient to supply some parts of the town, nor to allow the water to be successfully used in extinguishing fires. That the estimated expense is extravagant, and your petitioners are informed that the bill is of a speculative character.

Proceeding to consider the proposals of the corporation, he said that their scheme was cheaper for the inhabitants. The provisions of the bill as presented by the promoters were arbitrary and harassing. At the present time the water was supplied at a cost of about 7d. in the pound of rental value, whereas the promoters sought power to charge 2s. in the pound. The corporation were able to supply water by gravitation from an elevation 65 feet higher than the promoters could. Then the expense of the corporation works would be £6500 as against £12,500.

Mr. MICHAEL: £5800.

Mr. RODWELL: Does your estimate include the pipe?

Mr. MICHAEL: £5800 includes the whole town.

Mr. RODWELL said the water proposed to be taken by the corporation required hardly any working at all, because the level of the ground caused it to supply by gravitation 65 feet higher than the promoters could. If he proved these facts, he thought the committee would be of opinion that the proper parties to supply Tenby were the corporation, and that there was no necessity for such an expensive measure as that which his learned friend was there to advocate.

Mr. MICHAEL said his friend stated that an expenditure was to be incurred of £6500 for new works to supply the town at a level of 65 feet above the 60 feet which the company were to supply. That was an entirely new competing system, and he contended that the petitioners could not set up what was in fact an alternative scheme when they had given no notice of it to the promoters. It had been held continuously by committees that such a competing scheme could not be set up unless due notice of it was given. This was not the present Hollybush system, but it was a proposition to construct a new reservoir, and to expend £5000 or £6000 in order to perfect the supply to the town.

The CHAIRMAN said of course if that was the case the committee could have nothing to do with it.

Mr. RODWELL said the corporation already possessed the Ladywell spring, and all they proposed to do was to use it in another way in order to give an ample supply to Tenby. They had merely to put down fresh pipes, it was not a new scheme.

Mr. MICHAEL said this was a new scheme 90 feet higher, and with a new expenditure of £6000—an entirely new scheme by gravitation.

Mr. RODWELL said the Ladywell was in the hands of the corporation, and they had a lease for 50 years. It was only proposed to increase the supply from that source by purchasing the freehold of that spring, so as to enable them to borrow money. All he proposed to do was to show that by further utilizing the existing supply by the same process, namely, gravitation, which was at present employed, they could augment the existing supply.

The CHAIRMAN said his impression was that the committee were bound to hear the case of the corporation as regarded the increasing or further developing of their present source of supply.

Mr. MICHAEL said there could be no objection to their improving their present source of supply upon that spot, but when it came to constructing a reservoir 90 feet higher upon other ground, surely that was an entirely different scheme.

The CHAIRMAN said he must hear all that was to be said as to developing the supply from the present source.

Mr. *White*, examined by Mr. MANSELL JONES.

I reside at Tenby, and have been mayor on several occasions. I took anactive part in causing the town to be properly drained. I am intimately acquainted with the requirements of the town. Before 1866 there was not an ample supply of water, and when the Pembroke and Tenby Railway was constructed we thought it a favourable time to take the matter in hand, and to lay the pipes along the railway, as it would save expense. We then took a lease of the Ladywell. I should say the Ladywell is considerably higher than the cutting of the railway. The pipes lead down to the railway. Those pipes were provided by the corporation. The railway company had a spring at Hollybush, and we were very anxious to arrange in such a way that we should unite the Ladywell spring with the Hollybush. We conveyed the water along the railway, and permitted the railway company to use what water they wanted. 1870 was a very dry season, and even then we had a very fair supply. We were never without water. If all the houses had cisterns there never would have been any deficiency. The water is turned on for six hours a day, and if all the houses had cisterns there would be no deficiency. In 1870 there certainly was a deficiency, and for some time we could not discover the cause. We were afraid that there was some falling off in the springs. At last it was discovered that some of the earthen pipes had got broken near the Ladywell spring. In 1870 the Town Council determined by a majority of one to obtain water from the St. Florence Brook. So strong was the feeling against the scheme in the town that I, being in London at the time, was telegraphed for to come down and interfere, as it was feared there would be a riot. The feeling in the town was exceedingly strong. A very large majority of the ratepayers had made up their minds to memorialize the Board of Health against the scheme. There is an impression, rightly or wrongly, that the water is not good in St. Florence; in fact you have the sewage of two villages. St. Florence is a very large village. You have the whole of the sewage of St. Florence and of Gomperston; you have the sewage of two large graveyards, the burial-place for centuries of a large district; you have the whole of this on the banks, not of a river but of a stream, which during the summer months was not more than sufficient to fill a 12-inch pipe. After detailing the intermediate proceedings in the Town Council, the witness said: Directly this company was formed, a large meeting of the inhabitants passed a unanimous resolution to oppose the bill, as the whole scheme was considered wholly unnecessary. A meeting of the Town Council was held on the following day, and a majority of the whole council came to the conclusion to oppose this bill. The municipal election took place, and the feeling of the town was so strong, that two gentlemen who had advocated the sale of the corporation works, were turned out.

Mr. JONES: What is your opinion as to the supply of water from the Ladywell?

Witness: At the present moment we have 100,000 gallons a day, and, supposing this additional basin is made there, there is no doubt it will give a very bountiful supply. I am not sure that the present supply is not almost sufficient without any additional supply. I believe that is the general opinion in the town.

Cross-examined by Mr. MICHAEL: Do I understand you that at present the railway are supplied with water both from the Ladywell and the Hollybush spring?

Witness: Oh, yes; it comes down through a large pipe from the two springs. The railway take their supply below the line of junction.

Mr. MICHAEL: Will you explain to the committee how it was that having that combined source of supply they had not sufficient for their engines?

Witness: The fact is, the town drew as much as they could, and the railway as much as they could. The main supply leads directly to the town from the Ladywell and Hollybush springs, and where it branches off to the town there is a small pipe laid on from there to the railway station.

Mr. MICHAEL: During the summer was there water coming down to the town?

Witness: Certainly. We measured the water at that time, and found there were 42,000 gallons running in in the very driest time of the summer.

Mr. MICHAEL: What is the comparison of the water coming from the Hollybush and from the Ladywell?

Witness: I should say the quantity from the Ladywell is considerably larger than that of Hollybush. Under the lease from Miss Richards we take also the Knightson spring, and we have power to construct a small basin at Knightson. The great source of contamination is above where the promoters propose to take the St. Florence water. There is no general system of sewerage, but the villages make use of the stream as an outlet where they empty all the sewage matter. There are a great number of pigsties, even almost on the brink of the stream. We have no jurisdiction there, as it is without our limits. It is only lately that there has been a rural sanitary authority there.

Mr. MICHAEL: Are you aware the analysis showed that there were no animal impurity in the stream?

Witness: That would depend very much on the time of year when the water was taken. It was taken and tested in the month of February, after the stream had been thoroughly flushed by the winter rains, but I believe if that water had been tried in July and August you would have found an amount of animal matter there that would have rather startled you.

Mr. *George Wilson Stevenson*, examined by Mr. THESIGER.

I am a civil engineer, residing at 19, Great George Street, Westminster. I have had a very large experience in the construction and management of water-works. I have been engineer-in-chief for more than a dozen water-works in different parts of England. I am well acquainted with Tenby, and am lessee of the gas-works there. As such lessee I am one of the largest ratepayers in Tenby. I have taken the corporation water, and have always found it both good and plentiful. I know their present reservoirs, which are conveniently situated. They do not command the very highest parts of the town, but they do command the greater part of the town efficiently. In the autumn of last year the retaining wall of one of the reservoirs fell in, and it was immediately afterwards that the resolution to advertise for a purchaser was come to and carried by a majority of one. Many people expressed to me their dislike of the idea of parting with the water-works, and, in fact, the resolution was cancelled at the succeeding meeting, and the gentleman who moved that resolution has now retired from from the council. I know that the corporation have made arrangements for acquiring the whole of the water from the Ladywell, instead of allowing the railway company to have any of the water as they now have. I am acquainted with Mr. Burn's plan for adding to the supply of water by catchwater drains for collecting all the water which at present partly issues at the Ladywell, and partly finds its way underground. In my judgment it will give amply sufficient water for some time to come and Tenby will be adequately supplied with good pure water for some years.

Mr. THESIGER: Are you aware of any precedent where a corporation has already got an existing source of supply, and are supplying a town, for a company being introduced to supply the town against the will of the corporation?

Witness: No, I have no knowledge of such a precedent, and I do not believe there is any such precedent.

Mr. THESIGER: The evidence on the part of the promoters is that the lift to the reservoir will be 150 feet. What do you say to that?

Witness: It is not so. The lift to the reservoir will have to be 208 feet according to their deposited sections. The engines would have to lift the water from a stream 208 feet into the reservoir before the water began to be filtered, and it could come away from the town of Tenby. For a lift of 208 feet the horse power required is 20 instead of 12.

Mr. THESIGER: Are you aware that they propose to give not duplicate engines, but merely a double-action engine?

Witness: A single engine and a single boiler, so that there may at any time be a break-down, and the town may be without water. In any well-arranged water-works the pumping power is in duplicate, and must be in duplicate of necessity, and, therefore, two 20-horse engines, pumps, and boilers, for raising 160,000 gallons in ten hours, are necessary for this scheme.

Mr. THESIGER: Taking the expense of that, the reservoirs and filter-beds, conduit-pipes and so forth, what in your judgment would be the expense?

Witness: The works cannot be done under £13,000, including the duplicate engines. Looking to the present supply of Tenby, I do not think it expedient that another company should be introduced in opposition to the corporation.

Cross-examined by Mr. MICHAEL: I ask you in fairness, is not the corporation adequately protected by the three alternatives which are suggested—first, to make it a suspensory bill, that if an adequate supply is brought into the town the bill shall not come into force?

Witness: If you ask my candid opinion, I think that the bill is premature.

Mr. MICHAEL: Is it unfair, under the circumstances of this case, that we should consent to suspend any operations for twelve months?

Witness: Twelve months is not enough; it does not give the corporation time to mature their plans and carry them into full operation.

Mr. MICHAEL: What would, in your opinion, be sufficient?

Witness: I think two to three years; not less than two nor more than three.

Mr. MICHAEL: Now I come to the second alternative. Is it not fair, looking at the terms of the advertisement, that there should be an offer in this bill to purchase the existing works of the corporation at such price as may be determined by arbitration?

Witness: Yes; but not on the terms set forth in the bill. The bill is most unjust and unfair, as between the corporation and the company, as regards the terms of purchase, especially with regard to the corporation bearing the costs of the arbitration.

Mr. MICHAEL: Show the committee how the corporation are compelled to sell?

Witness: It would amount to a compulsion to sell, because the company and corporation could not live together in so small a town; one of the two must retire. But the objection I entertain to the 32nd clause is a much more serious one. That clause states:—

> If within two months after the passing of this Act the corporation shall by notice in writing under their common seal intimate to the company their desire to sell to the company all or any part of the mains, pipes, and water-works, plant, or implements of the corporation, the company shall be bound to accept a transfer thereof; and such transfer shall be made for such price and upon such terms and subject to such conditions as the company and the corporation may agree on; and in default of agreement then the same shall as a question of disputed compensation be determined by arbitration, in accordance with the provisions in that behalf contained in "The Lands Clauses Consolidation Act, 1845," save only that the arbitrator shall be appointed by the Board of Trade, and the corporation shall bear the costs, charges, and expenses of such arbitrator, and that the question to be determined shall be the value of such mains, pipes, and plant for the purpose of future water supply by the company.

If I understand the meaning, it is, that in so far as the company could make use of the mains, pipes, and plant of the corporation, the company would pay the corporation the value of those things, *quâ* mains, pipes, and plant, and nothing more, and the corporation would have to give up their business in water supply and part with their undertaking and plant as so much old iron.

Mr. MICHAEL: Would not the arbitrator have power to award what the things were worth?

Witness: Simply as materials—the structural value of the works.

Mr. MICHAEL: Do you wish the committee to understand that the corporation are traffickers in water the same as a company?

Witness: A corporation sells water for profit the same as a company does, and does make a profit by the sale of water, using the surplus for general municipal purposes in reduction of rates and the improvement of the town. I think the corporation and a company ought to stand on precisely common ground in the sale or purchase of a water-work or gas-work.

Mr. MICHAEL: What have you to say to the compulsory power given to the corporation to acquire these works at any time?

Witness: I object to the terms; they are all for the company and nothing for the corporation. In the one case the corporation simply get the value of their mains, &c., but if the company are to be sold, they are to get their value as a commercial undertaking, and are to be held harmless of all the costs of the reference.

Re-examined by Mr. THESIGER: Did you ever hear of a bill being held in suspense over a corporation for two or three years?

Witness: I never heard of such a thing. I do not think the corporation will be much damnified by it if they are not prejudiced in borrowing their money.

Mr. *William Burns*, examined by Mr. MANSELL JONES.

I am a civil engineer, and have had large experience in sewage and water works. I surveyed the Ladywell scheme, and made a report to the corporation. That is with reference to an extension of the Ladywell scheme. It is on the same

ground at present occupied by the Ladywell spring; it occupies no other ground. In the report I state that I have made a careful examination of the ground, and that in my opinion there is an abundance of water to be obtained by forming a contour catch-water drain sufficiently deep to intercept the springs that rise out of the sandstone rock beneath, with a number of feeding drains leading into the main drain. A constant supply of pure water could be obtained from the basin during wet weather to the extent of 300,000 gallons per day, and during the dry season of 100,000 gallons a day.

Some discussion took place as to whether the new works were within the limits of deviation at present possessed by the corporation, and the witness explained the situation of the works to the committee.

Mr. MICHAEL renewed his objection that the corporation were precluded from entering into any new competitive scheme.

The CHAIRMAN said he was disposed to limit the inquiry. He must allow it to be shown that a large increase of water could be got from the Ladywell spring, because that might be taken down into the existing pipes.

Mr. MICHAEL said he was willing to admit it was possible there might be by some means an enlarged supply taken down by the present pipes, but what had that to do with the circumstances of this inquiry?

The CHAIRMAN said the committee would clear the room, and definitely settle the question.

Mr. MICHAEL contended that the existing lease did not vest a single inch of land in the corporation, but they had merely an easement for their pipes.

The room was then cleared, and, on the readmission of the parties,

The CHAIRMAN said: The committee will consider the possibility of utilizing the existing supply, but will not go into any alternative scheme such as that in the plan submitted to the committee.

Mr. MANSELL JONES (to the witness): Can you increase the supply from the Ladywell springs?

Witness: They are a mass of springs all over the field. The water in the field is pent up by a stratum of stiff clay upon the top of the rock. It is not in the nature of an ordinary watershed. By sinking a fresh well upon the springs you would increase the water supply. Six trial holes have lately been sunk, and an additional supply of water is obtained from each.

Cross-examined by Mr. MICHAEL: Do you put it down as a proposition that in proportion to the number of wells so will be the quantity of water?

Witness: Yes. We had six wells sunk, all running at the same time. These wells are all nearly upon the line of the present pipe that is laid. Three of the wells are beyond the limit of the present works. Each hole yielded about 4000 gallons a day. The Ladywell was flowing at the same time, and producing over 30,000 gallons a day.

Mr. MICHAEL: Where is the outcrop of this rock that forms the stratification?

Witness: About five miles to the west.

Mr. MICHAEL: Is the stratification regular?

Witness: No, it is very much contorted.

Mr. MICHAEL: Do you mean the committee to understand in a contorted stratification of that kind you can depend upon sinking wells along the whole course of this spring, and determine how much you will get by merely sinking two trial holes?

Witness: You can come to a pretty near guess. Looking at the time that the Ladywell has run, seeing that the sinking of other wells does not diminish the supply from the Ladywell, you can calculate the increased supply. I do not know anything of the summer value of these streams.

Mr. MANSELL JONES: You can, within the limits of deviation as stated in this plan, procure the 300,000 gallons in a wet season and 100,000 in a dry season?

Witness: I can.

Mr. *Douglas Onslow*, C.E., examined by Mr. THESIGER.

I went over to the Ladywell springs with Mr. Burns, and can confirm his opinion that if the reservoirs and pipes are put in repair there will be an ample supply for Tenby within the limits of deviation.

Mr. *David Thomas*, examined by Mr. THESIGER.

I reside near Tenby, and am a farmer. My farm adjoins the land a little lower down than the Ladywell springs. During the last 40 years there has always been a large flow of water from that spring; it has never been known to be dry. In 1870 the deficiency was owing to a leakage in the pipes. The Hollybush drain proper is not affected at all. The Tenby people have not got it. It always gives a good supply of water.

Mr. *Richard Mason*, examined by Mr. THESIGER.

I am an alderman of the borough of Tenby, and have resided there over 20 years. I entirely agree with Mr. White as to the public feeling in the town with reference to the sale of the corporation works. The feeling is not against this company in particular, but against any company that should purchase the existing water-works.

Mr. *Charles Henry Smith*, member of the Town Council of Swansea, gave confirmatory evidence.

Mr. MICHAEL briefly replied upon the whole case.

The room was cleared, and, on the readmission of the parties,

The CHAIRMAN said: The committee find the preamble of the bill not proved. They are of opinion that the evidence in support of this bill is insufficient. They further find that the necessity of an improved supply of water to the town of Tenby and its vicinity has been proved to their satisfaction, and the evidence of the petitioners, being the Corporation of Tenby, warrants the conclusion that the local authorities will take immediate steps for supplying the deficiency.

MONDAY, MARCH 17.

(*Before Mr.* BATHURST, *Chairman; Sir* R. BLENNERHASSETT, *Lord* KENSINGTON, *and Mr.* RIDLEY.)

BURLEY LOCAL BOARD WATER BILL.

Mr. DENISON, Q.C., Mr. RICHARDS, Q.C., and Mr. MICHAEL, appeared for the promotors; Mr. POPE, Q.C., and Mr. THESIGER, on behalf of the petitioner, Mr. Hudson.

Mr. DENISON, in explaining the objects of the bill, said: Burley is situated 16 miles above Leeds, and is a *quasi* manufacturing village. There are some mills near belonging to the Right Hon. Mr. Forster. A local board was formed in 1855. From 1861 to 1871 the population increased from 2130 to 2271, and it is likely to increase still more rapidly, because a few years ago a railway was opened connecting Burley with Leeds, Bradford, and other large places. It lies in a valley famed for the excellence of its waters, and there are two large water-cure establishments in the neighbourhood, the celebrated Ben Rhydding being one. In the year 1849 a gentleman of the name of Horsfall, living at Burley Hall, under some sort of arrangement with fifty or sixty of the inhabitants, undertook to erect water-works, the supply being obtained from streams and springs, and collected in a small reservoir. This satisfied the wants of the place for some time, but it was at last found that the water was contaminated, and especially by the gentleman who was the only petitioner against the bill. Typhoid fever became prevalent in the place, and an officer was sent down to examine the neighbourhood. He reported that the water of the springs was unfit for human consumption, and that the water from the brook was also impure, and would continue in that state so long as the stream received the overflow from certain cess-tanks belonging to the petitioner, Mr. Hudson. The cost of the proposed works would only be £8000, or, as usual, about £4 a head. It was intended to abandon both the Rough Hole Spring and the Coldstone Beck, and to collect the water of the valley of the Wharfe, which is some miles wide. The principal reservoir would be on the property of Mr. Hudson, and that was one of the things he objected to. He complained of the reservoir being placed too near his house, but some months ago he wanted the promoters to build it still nearer. This showed that the proximity of the reservoir was not really an objection, in his opinion; but a large reservoir could be made only in particular situations, and the engineer would satisfy the committee that there was really no other place in the valley where it could be made with any advantage. The promoters had done all they could to meet Mr. Hudson's views, and were willing to do all they could for him. His petition also complained that the proposed works would impound the water of Rushy Beck, but there would still be left more water than he could use; and they were willing to give a special undertaking to that effect, if the General Act were not considered sufficient. Surely, Mr. Hudson might remember what it was that compelled them to come to Parliament. It was his cesspool which made the present supply unfit in quality as well as insufficient in quantity, and therefore he ought to have been the last person to object to the bill.

Mr. *William Firon*, examined by Mr. RICHARDS.

I live at Greenholme. I am a justice of the peace for the West Riding of Yorkshire, and chairman of the Local Board of Burley. The district of the local board coincides with the township of Burley. The only water supply is derived from works constructed by Mr. Horsfall, who formerly lived at Burley Hall. We have settled for his interests, which now belong to the trustees of his married daughter. The township is largely increasing, both in population and buildings. Mr. Horsfall first commenced to give a supply of water about nineteen years ago. The supply at present is insufficient in quantity and inferior in quality. It has very often the appearance of pea soup. In 1869 Dr. Radcliffe was sent down by the Board of Trade to make inquiries, and, in consequence of his report, the local board applied to Mrs. Crofton (Mr. Hudson's daughter), and asked her if she would undertake to give an increased supply of pure water. She declined. Thereupon the board called in an engineer, and gave him instructions to do the best he could, at the least expense, towards getting a supply of good water for the village. The local board approved of the scheme which he drew up. I cannot see that any damage will be done to the residential value of Mr. Hudson's estate by the proposed works. Mr. Hudson's sewage empties itself into Coldstone Beck. The main sewage drain and the water and the gas pipes all pass under my ground, but do not interfere in any way with the property. I am a large ratepayer, and a member of a firm which pays one-quarter of the whole of the rates. With the exception of a dozen or fourteen, I should say that the whole of the population are working people.

Cross-examined by Mr. POPE: The local board delayed taking any steps as long as they could, because the population are so poor that we did not wish to tax them too much. The existing supply is partly from a spring in a field, and partly, in dry seasons, from the Coldstone Beck. We are to give £4000 for the interest of the present proprietors. I have been under the impression that we had no right to the water out of the Coldstone Beck. The proposed line of pipes crosses Mr. Hudson's estate from end to end.

Mr. POPE: Are you aware that the plans were drawn up, the reservoir projected, and the direction of the pipes decided on, without any communication with the gentleman through whose property and upon whose property your works are to be placed?

Witness: The board made no communication. We left it to the solicitors and engineer. On the 27th of January Mr. Hudson wrote to us, through our solicitors, suggesting that a new main of large dimensions should be laid from the reservoir, and that additional springs should be utilized. He recommended us to take the Robin Hole Spring, to construct our reservoir at Robin Hole, and to bring the service-pipe along the main road, thus avoiding any intersection of pipes in front of his house. The local board never held any communication direct with Mr. Hudson.

THURSDAY, MARCH 20.

This morning, a settlement with the petitioner having been arrived at, the preamble was agreed to, and the clauses considered and passed.

MONDAY, MARCH 24.

(*Before the* EARL OF MARCH, *Chairman; Mr.* PEASE, *Mr.* A. BASS, *and Colonel* RUGGLES BRISE.)

GLASGOW CORPORATION WATER.

Mr. CLERK, Q.C., appeared for the promoters, the Water Commissioners of Glasgow; and Mr. RODWELL, Q.C., and Mr. ANDERSON for the trustees of Mr. Dixon, of Govan, and certain other proprietors of lands and works fronting the river Clyde, and situated above the Albert Bridge.

Mr. CLERK said the object of the bill was to extend the time for the construction of works authorized by the Glasgow Corporation Water-Works (Amendment) Act of 1866, and to abandon part of the works, and for other purposes; and he thought the only question in dispute was with regard to the length of time for which there should be this extension. The only matter recited in the preamble to which it was material he should address himself was—"Whereas, by the Glasgow Corporation Water (Amendment) Act of 1866 the commissioners were authorized to construct the reservoirs, pumping-station, and conduits or main-pipes therein described, for the purpose of supplying water for trading and manufacturing purposes, and the said reservoirs, &c., had not been constructed, and the time limited for the completion thereof will expire on the 6th day of August, 1873, it is expedient that the time should be extended, and further provision made for the waste and misuse of the water supplied by the commissioners." That obligation was undertaken by the Water Commissioners in order very much to relieve others of removing a certain bar, which existed in the river Clyde. There was a dam or weir across the river Clyde, which had been fixed under the provisions of an Act of Parliament, and which, while it was condemned on account of its injury to the navigation of the Upper Clyde, had been held by the Legislature as necessary to be maintained for the purpose of supplying factory owners located above the bridges with water. By the Act of 1866 the Water Commissioners of Glasgow undertook to construct reservoirs, and to supply them with water for the service of the factories, and when that was done, and until then, were they to be at liberty to remove this dam. There was as long ago as 1840 an obligation on the Clyde Trustees to maintain the weir for the purpose of supplying a sufficient quantity of water above the bridges for the use of the manufactories, but in 1858, in a clause in the bill of the Clyde Trustees, the existence of this weir was condemned. The petitioners were the trustees of Mr. Dixon, of Govan, and certain proprietors and occupiers of lands situated on the river Clyde, all of whom were interested in the navigation of the river above the bridges. In 1866 the obligation to remove this dam was undertaken by the Water Commissioners of Glasgow, the Act passed in that year providing that, on the expiration of three months after the reservoirs and pumping-station had been completed, it should be lawful for the commissioners to remove the dam. The dam had, until its removal, to be maintained by the Clyde Trustees. The time for the completion of the reservoirs would soon expire. Much as the commissioners had done for the purpose of supplying Glasgow with water, they had not been able to complete this work up to the present time, but they were now desirous of proceeding with the work, and were only asking for an extension of time within which to do it. The only question which would arise here would be as to the length of time within which they should be required to do it. The promoters were anxious that too heavy a burden should not be laid upon the ratepayers by the obligation to complete the works within a short time, and they

therefore asked that five years should be the time allowed. The petitioners asked that if any such extension of time were given it should only be for three years.

TUESDAY, MARCH 25.

Mr. J. M. Gale, C.E., examined by Mr. CLERK.

I am engineer of the Glasgow Corporation Water-Works. I prepared the plans in 1866 for the works of that company. Those works have not been completed, and it is with the view of completing them that we are now asking for an extension of time. Under our bill of 1866 we got powers to erect a pumping-station and reservoirs on the river above the highest of the bridges. Our scheme of reservoirs originated out of a desire expressed on the part of the Clyde Trustees to remove the weir. Those reservoirs were designed so as to supply water by force of gravitation on three levels—the higher, the middle, and the lower. Our power of removing the weir depends upon our power to give the manufacturers on the lower level a sufficient supply of water. The Act of 1866 said that the cost of removing the weir was to fall upon the Clyde Trustees. They were to pay £5000 to the Water Commissioners in lieu of an equal sum which the Water Commissioners were to hand over to the manufacturers in order to defray the cost they would be put to in lowering their pipes to the lower level. By our Act of 1866, we were bound to supply 5 million gallons of water per day to the factory owners on the lower level, the price being fixed at 5s. 6d. per 1000 gallons. We have made 2¾ miles of water-mains to supply the lower level. When we first obtained our powers, cast iron was only £5 10s. a ton, but we would now have to pay £11 a ton for it—exactly double. There has been a great deal of discussion in Glasgow as to the effect of removing the weir, it being contended that if it were taken away the sewage that falls into the river would be carried far above where the weir now is. We are bound by the Act of 1866 to complete our works by the month of August of this year. We now ask that the time be extended five years, because if we are compelled to complete them in the specified time, with iron at its present price, a very heavy loss will be incurred, which must ultimately fall upon the ratepayers. There is a prospect of iron falling in price in the future, and there is also a prospect of some scheme being adopted to intercept the sewage, and prevent it falling into the harbour. Should both these events happen, as I have reason to believe, then we will be able to construct our works at moderate cost, and we will be able to remove the weir without any evil consequences arising from the sewage.

Cross-examined by Mr. RODWELL: I have no doubt those of the proprietors on the upper reaches of the river, who use the river for the purposes of navigation, suffer some inconvenience from the existence of the weir.

By Mr. ANDERSON: Apart from the present high prices of materials and labour, these works could be executed within three years.

Mr. J. F. Bateman, C.E., examined by Mr. CLERK.

I constructed the Glasgow Water-Works on Loch Katrine. I am acquainted with the plans of the works proposed in the bill of 1866. At that time I estimated the cost of supplying the manufacturers with 5 million gallons of water at £47,000; but if the works were now to be carried out, they could only be done at an increased expense of 50 per cent. Everything that would be required in the works has increased enormously in price, and I do not think you can calculate on any material reduction in that price for at least two years. That being the case, I think that a five years extension of time for the extension of the works is not only not unreasonable, but absolutely necessary.

Mr. *James Brown*, deputy-chairman of the Water Commissioners, was next examined, and gave corroborative evidence.

This closed the case for the promoters.

For the petitioners the following evidence was called:—

Mr. *Logan*, examined by Mr. RODWELL.

I am the manager of Govan Colliery, belonging to Mr. Dixon. The output of Mr. Dixon's collieries is about 300,000 tons a year. Those coal-fields extend from Hutcheson Bridge all the way down to Govan. It is of the utmost importance that Mr. Dixon should obtain facilities for shipping his coal down the river. At the present time he has two quays above the weir, where he ships his coal on board barges. Those barges carry the coal down to Greenock, Port Glasgow, and other places. I think if the weir were removed it would be a great advantage to us, and would give a great impetus to our coal trade. The barges require to go through the weir lock at the weir, which is the cause of great delay and inconvenience. It is a great obstruction, and were it removed, the coal proprietors above the weir would be able to send their coal down the river without any delay. I believe the traffic would be greatly increased if the weir were removed. I know that Mr. Dixon is very anxious to get the weir removed, and that his father also wished to have the same thing effected.

Mr. *Thomas Seath*, senior partner of the firm of T. R. Seath and Co., shipbuilders, Rutherglen, stated that his shipbuilding yard was situated close to the river. His firm had machinery for carrying on a large shipbuilding yard, and, were it not for the existence of the weir, they would be able to launch large vessels. As it was, they were compelled to restrict their operations owing to the difficulty of getting the ships, when they were launched, through the lock or over the weir, and so down the river. When they extended their shipbuilding yard, they calculated upon the removal of this weir, and they spent a large sum of money on prospective works, in the belief that the weir would be taken away.

By Mr. PEASE: I have been a shipbuilder at Rutherglen since 1854. When I settled there I was quite cognizant of the fact of the existence of the weir.

Mr. *James Marshall*, owner of two steam lighters on the Clyde, and residing at Greenock, was next examined. He stated that he was in the habit of going up and down the river between Greenock and Rutherglen. He found the weir a great obstruction in getting to and from Rutherglen, owing to the obstacle presented by the lock and its bad state of repair. He had frequently been detained a week at the lock before he could get through.

Mr. ANDERSON was about to call Mr. Crouch, engineer, to speak to the defective state of the lock, when the chairman intimated that the committee did not require any further evidence on that point.

Mr. ANDERSON then addressed the committee on behalf of the petitioners against the bill.

The room was cleared, and, on the readmission of the public,

The CHAIRMAN said: The committee are of opinion that the preamble of the bill is proved; but with regard to the time for the limitation of the works, they wish to fix it at four instead of five years.

At the request of the petitioners, the clauses were altered so as to make the obligation to complete the reservoirs and remove the weir in four years more stringent. The committee, however, refused to insert a clause making it imperative on the Clyde Trust to put the lock at the weir into thorough repair, and to dredge above and below it to the full depth of the channel below the bridge.

TUESDAY, MARCH 25.

(*Before* G. TOMLINE, *Esq.*, *Chairman*; *the Hon.* L. G. AGAR-ELLIS, *Sir F.* WILLIAMS, *and W.* M'KEOWN, *Esq.*—J. BONHAM-CARTER, *Esq.*, *sitting as Referee.*)

NOTTINGHAM GAS BILL.

Mr. DENISON, Q.C., Mr. RICHARDS, Q.C., and Mr. MICHAEL appeared as counsel for the bill, which was opposed by the Corporation of Nottingham, who were represented by Mr. VENABLES, Q.C., and Mr. HORACE LLOYD, Q.C.; Serjeant SARGOOD appeared on behalf of the Nottingham Town Lighting Committee; and Messrs. STANHOPE and DORINGTON for the Local Boards of Lenton, Swinton, and the Vestry of Radford.

Mr. DENISON stated the objects of the bill, which he said was a very simple one, of the usual kind, to enable the company to raise more money for the purpose of complying with the requirements of the district. Dealing with the history of the gas company, he said it started in the year 1818 with a small capital, but nothing happened worth noticing until 1842, when it was reconstructed by another Act of Parliament, obtained fresh capital, and was authorized to pay a dividend of 10 per cent. upon the new capital. In 1844 the company voluntarily exercised a power for selling their new shares by auction. They seemed to entertain the impression that it was desirable to throw off as much new capital as they could, instead of taking it up among themselves. However, they had grown wiser since then, and had suffered some unpleasant consequences from the result of that action already, for it had always been insisted upon that, as they did that voluntarily in the first instance, they should be obliged to do it by compulsion afterwards, and that was the contention now put forward by the corporation. In 1845 they raised more capital. In 1849 they came to Parliament again for capital, and then agreed to sell their shares by auction. The Act of 1853 provided for an increase of the capital to £200,000, and that Act contained the further provision that the original shares which, which were £25 each, should be nominally increased to £50, and that the dividend upon the new shares should be at the rate of 5 per cent. per annum. This was, of course, in effect continuing the 10 per cent. dividend for all the old capital. The old capital was raised nominally from £52,500 to £105,000; and an additional £95,000 was issued, making up the total to £200,000. Therefore, although since 1853 the dividend had been 5 per cent., it had really been 10 per cent. upon all the original shares. In 1853 the company volunteered again the same selling of shares by auction, and the result had been that the town had had the benefit of premiums, the company not receiving any dividends, to the amount of very nearly £70,000. In 1858 they had to come to Parliament again to enlarge their works, and the town increased so rapidly that again their capital was doubled upon the same conditions as before as to sales by auction and new shares, but with this alteration as to dividend—that they were to be allowed to raise their dividend from that nominal 5 per cent. to 5½, so long as they kept their price below a certain sliding-scale. There were different prices allowed for different quantities of consumption, but it might be taken that the average price was 3s. 6d.; therefore it might be said that upon the old capital the dividend was allowed to be as high as 11 per cent., and upon the new capital was limited to 5½ per cent. The limits of supply were extended by the Act of 1858. Those limits were extremely large, embracing an area actually larger than the area of the metropolis—namely, 137 square miles, the largest gas area in the kingdom. Within the metropolitan area there were thirteen old companies and some new ones also, whereas in the Nottingham area there was only this one company. The Corporation of Nottingham were now possessed with the idea that they ought to be entitled to buy up this company, and if the company's limits were confined to the corporation's limits there might be something in it; but when the corporation's limits were extended over this very large area, embracing 137 square miles, over a part of which the corporation had no jurisdiction, it was an additional reason why they should not be allowed to make themselves the gas suppliers for the whole district. There might be some reason for the corporation having the control of gas and water in their own area; but there was no reason that he could see, none that Parliament had yet seen, and none that any Royal Commission had yet seen, for the corporation to be the suppliers of gas and water for an area much larger than that of their own town. In 1858 the increase of the town became so great that the capital was doubled, and in 1863 the limits were still further extended. There was something peculiar in the increase of the town of Nottingham and of the gas consumption there. In 1853 the consumption was 118 million feet; in 1854, 127 millions. Then the consumption of gas doubled in eight years, for in 1862 it reached 269 millions; and in 1872 it had doubled again, for, as far as they could estimate the consumption, it amounted to 550 million cubic feet. He did not know any other place where the increase had been so rapid. That being so, the committee would not be surprised to find the company were again coming to Parliament to double their capital; and, inasmuch as the consumption of gas doubled itself in nine years, it certainly was not an unreasonable time to provide for, inasmuch as water companies and many gas companies were usually allowed to look forward to the period of not nine years, but 20 years, as far as they could calculate. Parliament had been in the habit of allowing in almost a standard proportion duplication of capital, and, in a great number of Acts in late years, the capital had been rather more than doubled. In 250 gas Acts which had been gone through, and the results compiled for this purpose, it would be found that the capital had been more than doubled. Therefore, in asking for a duplication in a town which had increased with this unusual velocity, they were certainly not doing an unreasonable thing. There was no complaint in the petition of the corporation as to the increase of capital, but the corporation sought to impose upon the company that which they introduced voluntarily and imprudently in the early years, when matters were not so well understood as now—namely, the voluntary obligation to sell the new shares by auction. The corporation desired to have that power and to limit the dividends in an unusual way. There was no doubt that the stereotyped form adopted by Lord Redesdale was that they should not be allowed to take more than 7 per cent. upon the new capital, and therefore the company asked for 7 per cent. on the new capital—that is, if they could earn it under the present existing circumstances, and whether they could or not was a problem which nobody could at present solve. It was a well-known fact that some old gas companies which were limited to a higher price than the Nottingham Gas Company were this session in Parliament for the purpose of raising their price. One company which was limited to 3s. 9d. had been allowed to raise their price directly 6d., and indirectly another 6d. by an alteration of the standard. The promoters of this bill were not asking to do that. There was no proposition in the bill to increase the price of gas, 3s. 6d. being still the maximum within the corporation limits, with an extra 1s. for the out-districts. A meeting was held in Nottingham in support of the petition presented by the corporation, and, out of a population of 90,000, the town-clerk succeeded in getting up a meeting of 19. The company strongly resisted the desire of the corporation to buy their works, and he knew of no instance where a bill had been carried contentiously through both Houses of Parliament in which a single company had been compelled to sell itself to the corporation. Cases had occurred in which competing companies had been compelled to sell, but there were no cases in which a single company supplying a town had been compelled to sell itself to the corporation; and it was not a fact to say, as had been said out of doors, that it was the policy of Parliament to compel the sale of companies to corporations.

Mr. *John Wilson*, examined by Mr. MICHAEL.

I am accountant manager to the gas company at Nottingham, and have occupied that position since the latter part of 1866. I am well acquainted with the company's affairs. The population of Nottingham in 1861 was 74,693, and in 1871, 86,741, giving an increase of 11,900, or very nearly 16 per cent. In 1861 there were 17,000 houses in Nottingham, and in 1871, 18,623, being an increase of 1569, or 9·2 per cent. The total population within the area of the Act is 87,027, and the total number of houses 18,989. The capital of the company already raised amounts to £388,063 2s. 6d. The authorized share and loan capital was £440,000. They had raised by shares £320,000; premiums for sale of shares, £28,063 2s. 6d.; loans, £40,000—making a total of £388,063 2s. 6d. The total assets of the company are £54,829 9s. 11d., and the estimated liabilities, £42,410—leaving £12,419 as the total capital. The premiums which

accrue from the sale of shares afford no dividend; they go into the capital, but there is no benefit accruing to the shareholders. The £12,000 left as floating capital is nothing like sufficient for the purpose. The consumption of gas has rapidly increased since 1858. The quantity in 1858 was 185 million, and the present quantity of gas consumed is 550 million. The amount of gas actually made is about 625 million, the difference between those figures being what is called unaccounted-for gas. The number of meters has very largely increased since 1854. In that year they were 4680, but they are now 24,239.

Mr. *Thomas Hawksley*, C.E., examined by Mr. MICHAEL.

I have been engineer to the company nearly 40 years, and have designed all the company's works, and have been the consulting engineer to advise them from time to time as new works or alterations were required. I have had very large experience both in this and in various other countries as to the construction and maintenance of gas-works. The company's operations are governed by the three Acts of 1853, 1858, and 1864. Their authorized capital is £400,000, with borrowing powers of £40,000. There is £54,000 unexpended share capital. There is a very peculiar clause in the Nottingham Act. The corporation asked us to make the premiums part of the £400,000, and we agreed to do it at once. The consequence is we are always obliged to make an estimate of how much we shall get by way of premium, inasmuch as we cannot by shares and premium raise more than £400,000. It is the only case of the kind in the kingdom. Out of that sum of £54,000 there are £42,000 required for existing liabilities, leaving about £12,000 for working capital. That is not an adequate sum to meet the exigencies of the case. The working capital of a gas company is always about 10 per cent. of the general capital. Of course they are obliged to keep large stocks of coal and other materials. Then there is the provision for wages. We have to make the gas, and sell the gas, and pay the wages, before we can get any return from the consumers. A quarter's wages, for instance, must always be provided by the company, and altogether, as a general rule, about 10 per cent. of the total capital of the company is required for working capital. We also require capital from month to month for extensions, and for a great many purposes. For instance, at the present time we shall be obliged to have at the commencement of next winter 25,000 tons of coal on our works, and I have no doubt we shall have to pay about £1 a ton. That will take £25,000.

Mr. MICHAEL: With respect to the amount of increase of capital, is it the practice of Parliament to duplicate capital?

Witness: Very frequently Parliament goes very much beyond the duplication. I have abstracted all the Acts which have been passed since the Gas-Works Clauses Act of 1847, and I find, excluding London, the original capital granted to different gas companies was £5,116,000; those gas companies have been to Parliament, most of them a second time, for additional capital, and Parliament has granted them £6,340,000 additional capital. That is more than duplication; but a duplication very rarely lasts more than ten years.

Mr. MICHAEL: Do you think companies ought to be obliged to come to Parliament oftener than once in ten years for capital purposes?

Witness: I should say not, because there is always a good deal of expense incurred.

Mr. MICHAEL: Has duplication occurred in the ratio which you described to the committee during your experience of Nottingham?

Witness: Yes; and singularly enough duplication has taken place every eight years since 1818—duplication both in capital and in supply, more particularly in supply than in capital. The original capital was £16,000, and the amount expended is now between £400,000 and £500,000, taking into account premiums which have been invested, not bearing interest. Thirty years ago the manufacture of gas per annum was 40 millions, and it is now 625 millions up to this very day; in fact, in the year we are now entering upon it will be 700 millions. There are three establishments, and more than 1200 retorts. The district is the largest in England, its area being 137 square miles. Besides Nottingham it includes a great number of manufacturing and mining towns and villages, with a total population of about 190,000. It is one of the greatest mining districts in the kingdom, and minerals have been developed with very great rapidity.

Mr. MICHAEL: Have you formed an estimate taking the ordinary ratio of what you will require in 10 or 12 years?

Witness: The ordinary ratio in districts such as Nottingham, Leeds, Halifax, Sheffield, Bolton, is 8 per cent. per annum. That would make a requirement of about £400,000 in the next 10 or 12 years. We are a little in advance of the times, having just constructed a large retort-house, and we have retort power that will last us for two years before we have to erect further retorts, so that adding that on, the capital we ask for would become absorbed in 10 or 12 years. I have been in the habit of making these calculations for the large manufacturing towns, and speak with the fullest knowledge of the subject, and have been concerned upon gas matters in all those places which I have mentioned. We require further land for the purposes of our works, but we are not opposed upon this part of the bill. That land is essentially necessary for the purpose of the company, in order to perfect our supply in the future.

Mr. MICHAEL: Comparing your company with others, how do you serve the public?

Witness: I suppose this is and has been the most liberal company in the kingdom. We supply the public at the very lowest rate and upon the very best possible terms, and with gas of a very superior quality.

Mr. MICHAEL: What has your dividend been, as compared with other places?

Witness: Our dividend has been only 8d. per 1000 feet, and in most places it varies from about 15d. or 16d. to 2s. per 1000 feet. That worked out at a per centage would give 5½ upon the shareholders money.

Mr. MICHAEL: About £80,000 has been put into the concern bearing no dividend to the shareholders?

Witness: I do not know exactly whether it is £80,000; I know of about £60,000 myself that has gone in without bearing a dividend.

Mr. MICHAEL: And that money has accrued from premiums upon the sale of the shares?

Witness: That was voluntarily begun in 1844, for the purpose of constructing an additional work which was then much wanted, and which the directors thought would not be remunerative. We ask 7 per cent. on the new capital proposed to be raised, it being the uniform practice to give that rate of interest on additional capital. Nearly all existing gas companies are on that footing. I have scheduled 250 Acts, and I find that upon the new capital in two cases 10 per cent. has been allowed; in five cases 8 per cent.; in seven cases from 7 to 10 per cent.; in 39 cases 7½ per cent.; in 125 cases 7 per cent.; in four cases 6 per cent.; and in one case, which is our own, 5½ per cent.

Mr. MICHAEL: Is there any reason, within your knowledge, why Nottingham should be an exception to the general rule?

Witness: There is no reason that I know of, excepting some people like to pay 5½ per cent. for an investment rather than 7; but, of course, at 7 per cent. we take all the risk, and not only do we take all the risk but these are becoming very risky times, and we are limited to a very low price of gas indeed. We are limited to 3s. 6½d. per 1000 feet.

Mr. MICHAEL: Do you know of any cases where Parliament has relieved companies subject to the same obligation as Nottingham?

Witness: I do. There is the great case of Liverpool. In Liverpool the shares were ordered to be sold by auction. By the Act of 1848 they were required to sell three-fourths of all their new shares by public auction, and to divide one-fourth. In 1865 they had occasion to come to Parliament again, and they then sought to be relieved of the auction clause and to obtain the usual dividend of 7 per cent. They were opposed by the corporation, and Parliament thought the time had come when they ought to be relieved from that obligation, and be put upon the ordinary footing, and they passed the clauses against the corporation. The Sunderland Water Company was relieved in the same way. The present price of gas in Nottingham would not be affected in any way by the proposed alteration. We have lowered our gas down till at last we were selling, up to last year and in last year at 2s. 8d., 2s. 9d., and 2s. 10d. per 1000 feet, and it is only the exorbitant rise in the price of coal which has induced us to add 4d. per 1000 feet to the price of last year, and we hope we shall be enabled to take that off again by-and-by.

Mr. MICHAEL: Will the fact of enlarging your works, and a more economical management, tend to reduce the price of gas in a ratio at least corresponding to any increase which would result from the increase of capital and the dividend accruing therefrom?

Witness: It will much more than correspond. The gas that we supply at the present time is of a very high illuminating power. It goes out of the works 18-candles, and is delivered throughout the town 16 to 16½. We furnish service-pipes and also meters to the public, without cost. Our meter-rents are exceedingly low, only just such as will cover maintenance and renewal. We have now 11,000 gas consumers, who do not pay us sixpence per week—that is to say, they have their light for less than a penny a day. Of course by this means we are conferring a great boon on the public. The mere fact that the dividend is only 8d. per 1000 feet shows that.

Cross-examined by Mr. VENABLES: I am engineer for the water company, and we introduced a similar bill to this during the present session. The bill failed. If we charge more than 3s. 6d. per 1000, we can only pay a dividend of 5 per cent. instead of 5½. We voluntarily introduced the auction clause in 1844. In 1849 we introduced a bill without a compulsory auction clause, but a compulsory clause was introduced in committee. In 1858 we proposed to double the capital.

Mr. VENABLES: And you then proposed to increase the dividend on the new capital from 5 to 7½ per cent.?

Witness: Yes; 7½ being then the parliamentary standard.

Mr. VENABLES: And also to leave out the auction clause as to a portion of the capital?

Witness: No; the bill was deposited in this form—that 4000 shares were to be distributed, and 12,000 to be sold. The result was the whole of the capital was limited to 5½ per cent., and the auction clause extended to the whole.

Mr. VENABLES: Are you aware that the corporation lately made a general offer to negotiate for the purchase of the gas-works?

Witness: They inquired if we were willing to sell, and if we would furnish them with a basis.

Mr. VENABLES: And you simply declined?

Witness: I think it was declined.

Mr. VENABLES: Would you think this a fair offer which I am now empowered to make on behalf of the corportion? It is in the form of a letter: "The town-clerk, by the authority of the corporation, offers your company, for the purchase of your undertaking, a perpetual annuity of £3 to each shareholder of £50 shares—that is, 6 per cent. annuity—to be secured in the usual way." I may ask you whether the conversion of your shares into £6 annuities fully secured would not be a considerable premium on the present price of the shares?

Witness: I should think it would.

Mr. VENABLES: And I think I may say a 6 per cent. fully secured perpetual annuity would be worth in Nottingham upwards of £70 for a £50 share.

Witness: I cannot say what it would be worth in Nottingham.

The CHAIRMAN: Is that proposal you have just heard from Mr. Venables new?

Witness: Quite new.

The CHAIRMAN: Of course you are not prepared to give an answer one way or the other?

Witness: No, I am not.

Mr. VENABLES: This is the first time it has been offered.

Mr. RICHARDS: It is obviously a question to which not only could we not give an answer without consideration, but we must also ask the shareholders.

This closed the promoters case.

Mr. VENABLES then addressed the committee on behalf of the corporation. He said they were opposing this bill not seriously on account of the amount of capital proposed to be raised, but on the ground that, whereas capital hitherto had been raised on certain terms, they were of opinion that it would be just and expedient that the new capital should be raised on terms more advantageous to the consumers. In this case everything that came into one pocket must come out of another. If the shareholders received an advantageous bargain, and were liberally dealt with, that liberality was entirely at the expense of the consumers. The case was this. Under a succession of Acts, in most of which the same question had been raised, it had been decided in the way which the corporation now contend it should be decided—that the company were entitled to 5½ per cent. as long as gas was below a certain price, and if it was beyond they were practically empowered to charge any price so as to secure 5 per cent. The corporation were of opinion that there was no reason, when the company wanted new capital, for giving a larger sum; and the proof of this was, that although 5, with the contingent ½ per cent., did not seem a very high rate of profit, it so happened that money seeking investment in property of that kind at Nottingham could be had to any amount at 4 per cent. The consequence was that the owner of a £50 share receiving 5½ per cent. could, at the present moment, sell it for £60, and he could sell it at £60 with every reason to suppose that Parliament would not grant this additional bonus or premium, because only a fortnight ago the Nottingham Water Company, of which Mr. Hawksley was also the adviser and engineer, promoted a bill running on all fours with this. They had performed exactly the same financial operation, they had changed the capital bearing 10 per cent. into double the actual capital bearing 5 per cent. They had received the 5 per cent., and they had an auction clause. They proposed to double their capital to get the additional capital at 7 per cent., and to omit the auction clause as applied to that new capital. The case was heard supported on their part by very much the same arguments and evidence which had just been adduced, and the committee rejected the bill. In that case also the corporation made an offer to purchase on terms which, as in the present case, would give the shareholders a large premium, not only on the original investment but on the present value of their shares. Some time ago his clients made a formal communication to the company, saying that they were willing to treat for purchase, not offering any exact terms. Their answer was that the undertaking was not for sale, and that it was no use making them any other offer. They now made the offer, but they were not particularly anxious to purchase the works. Mr. Denison had stated that Parliament did not favour compulsory purchase. Whether Parliament favoured compulsory purchase or not, the corporation were not now asking for compulsory purchase; what they were asking was that the committee should reject the terms proposed, and should let them have the new capital on the same terms on which they held their present capital. If the company would accept that, and preferred to keep their own property, the corporation did not propose any compulsory purchase. They merely said to the company, "If you do not like to take £400,000 at 5, with the contingent ½ per cent., then we will relieve you from the necessity of that which is an onerous obligation by offering you handsome terms of purchase." But they were entitled to use that as an argument with the committee. If the company got power to raise this capital on the same terms on which they had raised their existing capital—namely, the auction clause, and 5 or 5½ per cent.—they would be able to allot to their shareholders a bonus of 20 per cent.

on every farthing they called up. Of course, they would not call up the £400,000 all at once, but on every part of that which they called up, and as fast as they called it up. Even on the terms which he proposed each shareholder would get a bonus of 20 per cent. on a corresponding amount of his present holding. That was to say, his £50 would be turned into £60. If, however, the promoters succeeded in obtaining what they asked, every shareholder would have allotted to him £50 for every £50 he held, and that additional £50 at 7 per cent. would be worth £78 or £79; and that £28 or £29 of bonus which he would receive, distributed, of course, over 10 or 12 years, would every farthing come out of the consumers pockets. Mr. Denison said, and Mr. Hawksley said, why should these people be worse off than other shareholders; but he (Mr. Venables) was not aware that in all those 260 cases which Mr. Hawksley quoted there was a single instance in which the new capital had been allowed a higher rate than the old capital, and that was the material point. Wherever there had been a change it had always been in the way of reduction, and never in the way of increase. What the corporation proposed was that the shareholders should not receive a bonus, but that the money should be raised as it had been raised hitherto, by selling the shares by auction, for it was perfectly clear that it could be raised in that way. The corporation were ready to secure them 6 per cent. certain instead of 5 per cent. certain and ½ per cent. precarious. It was perfectly clear that if their 5 per cent. was worth £60, then 6 per cent. was worth £75. As they had 5½ per cent., he would not put it so high as that, but would say that the shares, being now worth £60, the corporation were willing to make them worth £70, and that was an answer to any possible hardship that they could allege. If they had any expectation of a bonus, there was a bonus for them. There was no question of compulsion of any kind. In conclusion he said this was the third time that the corporation and the company had fought out this battle, and in previous cases Parliament had confirmed the contention of the corporation.

Serjeant SARGOOD then addressed the committee on behalf of his clients. He said no evidence had been put forward by the promoters as to the necessity for this large amount of new capital. The ordinary evidence usually given before parliamentary committees as a reason for asking for money had not been given.

Mr. MICHAEL said Mr. Hawksley had stated that it was necessary, in order to purchase land and to extend the works. It was for his learned friend to cross-examine as to the details.

Serjeant SARGOOD said the whole of Mr. Hawksley's case here, as in the water bill, was that it was a usual thing with Parliament every few years to double capital; it was a usual thing to recognize that they must provide for 10 years in advance; it was a usual thing to anticipate wants, and to organize a supply for them. But Mr. Hawksley forgot what also was a usual thing, and a necessary preliminary, namely, to prove the existence of a want, to prove the nature of it, and to prove the estimate and cost of meeting it. The whole of that was absent. His evidence might just as well have been a speech on foregone conclusions. There was no case for this bill. He was not prepared to go quite so far as Mr. Venables on the part of the corporation, but representing the Lighting Committee, who were formed under a different Act of Parliament, and whose duty it was to rate the public for the purpose of paying for the public lamps, he submitted that there was no pretence of a case made out for this bill, and asked the committee to say that the preamble was not proved.

The room was then cleared, and the committee having deliberated a short time, the parties were called in, when

The CHAIRMAN said: The committee have decided that the preamble is proved. They wish to add that they will strike out the provisions of the bill which propose the creation of new capital at a higher rate of interest than the old capital, and that an auction clause similar to that which has hitherto existed, be added to the bill.

The clauses having been altered accordingly, the bill passed through the committee.

TUESDAY, APRIL 1.

(*Before Mr.* GROVE, *Chairman; Major* FRENCH, *and Mr.* JONES. *Sir* JOHN DUCKWORTH *sat as Referee.*)

GASLIGHT AND COKE COMPANY'S BILL.

Mr. DENISON, Q.C., Serjeant SARGOOD, and Mr. ASHLEY GLYN appeared for the promoters; and Mr. CRIPPS, Q.C., and Mr. PHILBRICK for the Metropolitan Board of Works. Petitions were also presented against the bill by the vestry of St. Martin's-in-the-Fields and other vestries and district boards of the metropolis, on behalf of which Mr. COWIE appeared as counsel and Messrs. DANGERFIELD and FRASER as agents.

Serjeant SARGOOD said this was a short bill, but there was some opposition to it. He was not quite clear, but he fancied that some modifications in the bill since it had been originally lodged had got rid of a deal of objectionable matter, and he hoped as a result that there would not be much left for his learned friends to comment upon. The bill was brought in by The Gaslight and Coke Company, and the objects of it were these. In the first place, by clause 3, they proposed to take powers for purchasing and working mines and collieries; also for purchasing and maintaining collier ships, lighters, and vessels. The whole of the first part of that clause was now gone, and they asked only for powers to convey coal for the purposes of their undertaking by acquiring lighters and other vessels. Then in clause 4 there was a question with regard to some rights of way. Clause 7 was for the purpose of amending some existing legislation with regard to recovering debts, and clause 8 was for the purpose of setting right a very palpable blunder in the Act of 1868. Clause 9 had gone. The promoters had arranged with the gentlemen concerned. Clause 10 merely allowed the company to apply to the purchase of collier ships such part of their existing capital as might be necessary, without asking for fresh capital. Then there was a manuscript clause which had been agreed upon with the Commissioners of Sewers, about which the committee need not be troubled; and that really was the only matter in the bill. To enable the committee the more readily to appreciate the opposition to the company, the learned serjeant said he would trespass for a few moments by recalling to their memories a little of the legislation of 1868. The Chartered Gas Company, by which popular name he might call it, although its statutory name was The Gaslight and Coke Company, was the oldest gas company in the metropolis. It obtained its first charter about 1812, having been in existence previous to that. In 1847 the Gas-Works Clauses Act passed, which was introduced to obtain more uniform practice amongst the companies; and in 1860 a further Act of Parliament passed, known as the Metropolis Gas Act, which was an Act of very considerable importance in the interests of consumers, and containing stringent provisions and regulations affecting gas companies. He would not weary them with matters of ancient date, but would proceed to 1868. Between 1860 and 1868 the operation of the Metropolis Gas Act of 1860 had been very well tested, and it was considered on the part of consumers that it had not operated so satisfactorily as had been intended and expected by its original promoters. There had been a large amount of gas agitation about 1866; and there was a very large committee, over which Mr. Cardwell presided, in 1867, before which there appeared all the gas companies, the Corporation of London and the Metropolitan Board of Works on behalf of the public. In this committee there was a discussion, at very great length—extending over a very considerable period—of all the questions relating to gas and relating to the requirements of the public, and the duties, or suggested duties, of public companies; and the committee came to some very strong conclusions against the gas companies. In the result a proposal was made by Mr. Cardwell to the assembled companies, represented by counsel, to accept from him the views of his committee at that moment. The gas companies, however, were not able immediately to bend to those views; they dissented from them, and tendered their objections to his views to the committee. The committee would not force legislation upon the companies, but made a very voluminous and special report upon the whole question of gas legislation, indicating what they thought ought to be done in the future, but declining to act adversely to the companies, after hearing the remonstrance which they had made. In 1868 there was a similar committee, with Mr. Cardwell at its head; and the Chartered Company were there with a bill for the erection of new works down at the eastern part of the metropolis; the consumers were there availing themselves of the report of Mr. Cardwell, and bringing in a bill to amend the gas legislation of 1860; and the Corporation of London were there asking for a bill in their own name to enable them to set up a gas manufactory of their own, and to wish the three companies in the City good-bye. Legislation of that description was a matter of very serious importance, not only to the public and the corporation, but to the companies themselves. The consumers bill was intended to amend the Metropolis Gas Act, which Act was applicable to the City of London, as well as to the metropolis generally, because in the Act of 1860 the City of London was not included within its limits. After a very long discussion, the Chartered Company, having conferred with the City and the Great Central—those being the three companies supplying the whole of the City proper at that time—intimated to Mr. Cardwell that they were ready to accept from him the legislation which he then tendered, to submit to the principles he had laid down, and promised to endeavour fairly and honestly to carry them out. The consequence of that offer was, first, that the corporation bill was not proceeded with, and secondly, that the consumers bill, which was intended to amend the Metropolis Gas Act of 1860, was taken as the foundation of the legislation of that year. All the amendments Mr. Cardwell desired were inserted in it, and the bill was rechristened by the name of the City of London Gas Act, 1868. The effect was, that the Metropolis Gas Act became limited in its operation to the City of London. That bill being passed through the committee, the Chartered Company's bill for the Beckton works and other matters came on; and, inasmuch as that company—unlike the two other companies in the City—had a large district outside the City boundary, the Metropolitan Board of Works pressed upon them, and the committee also adopted their views, that the City Gas Act should apply to the whole of their district, as well outside as within the City, thereby, of course, giving to the metropolitan people in their district the advantage of the new Act. The learned counsel had troubled the committee with these details in order that they might realize the position they had now assumed. Under the Act of 1868—the City Gas Act—amongst other things which were aimed at was the amalgamation of the several gas companies, the committee being of opinion that, in the interest of the consumers, they ought to enforce as far as possible the principle of the amalgamation of companies, with the view of saving the expense of duplicated mains and works, and duplicate boards for the discharge of their public business. By the 18th clause, therefore, and by several clauses following, the principle of amalgamation was first introduced. Amalgamation was sanctioned, and particular means for it were provided, a scheme having to be submitted to the approval of the Board of Trade, on which, as the case might be, the Corporation or Metropolitan Board would have liberty to be heard. The result of that was that the company the learned serjeant represented, and which had promised Mr. Cardwell to carry out his views, had, on the 31st of March, 1870, amalgamated with the City of London Gas Company; and on the 6th of July, 1870, they amalgamated with the Great Central. By that they became, and still were, the only supplying company within the limits of the City of London. In the same year, by Act of Parliament, they purchased the Victoria Docks Gas Company, which was an eastern company of the metropolis. In 1871 they acquired, by purchase, the Equitable, a very large, substantial, and important metropolitan company; and in 1872, last November, they, under an approved scheme, acquired the Western Gaslight Company. So that since 1868 they had fairly carried out their promise of amalgamation, and had honestly taken up Mr Cardwell's idea and worked it out. He might just tell the committee that by their 1871 Act, by which they acquired the Equitable, they obtained authority from Parliament to institute a short line of railway, which would be seen on the map, for the purpose of enabling them to get a line of communication with the Great Eastern Railway, over which they had a very large traffic for their coals, and from which line it was expedient for the company to get them into their works without the enormous expense entailed by carts and waggons. Having explained, therefore, the past legislation with regard to The Gaslight and Coke Company, he would only allude to the threadbare subject of the present crisis in coal to show that everything to promote economy in the purchase or in the transit was of the utmost importance to a company of this magnitude. With reference to light, the question of the transport of coal assumed an aspect of considerable importance to the company with a present consumption, in round numbers, of something like 500,000 tons a year. Three petitions had been presented against the bill—one by the Metropolitan Board of Works, one by the vestry of Paddington, and one by an agglomeration of many vestries, St. Martin's-in-the-Fields taking the lead, but Paddington, he was told, did not appear. He would take the petition of the Board of Works first. He did not know that the vestries could have a distinct case apart from the Board of Works, because the latter body were what he might call the parliament of all the vestries, and therefore they represented the vestries which appeared on this petition. The Metropolitan Board of Works began the practical part of their petition in paragraphs 11 and 12, commenting upon clause 3 of the bill, in which were provisions for leasing, purchasing, and working mines, and purchasing and working collier ships. Their objection was, that if they should give the company power to extend their capital—that meant, he supposed, expend—a clause should be introduced regulating something about illuminating power and price, so that any loss which arose might not fall on the consumer. He (Serjeant Sargood) apprehended that the whole of that was gone, because all that was speculative in character, such as acquiring and purchasing mines and collieries, had been struck out of the clause; and he could not imagine there was much in the petition which would be directed against ships. He was informed, however, that they would object to that, but he would wait and see what their objections were. In paragraph 13 they referred to clause 4 of the bill with regard to a right of way over some land at Barking; but that clause had also been struck out of the bill. He might as well tell the committee what that clause meant. The Board claimed to have a right of way through their works to get to their great sewage outfall. The company said there was no right of way. In their Act of 1868 some clauses were introduced to preserve that right of way, if it existed, but very carefully guarding against any recognition of it. The company were anxious to get rid of the question by having a clause inserted in the bill effectually to stop it up and make compensation to any persons who could prove they used it. But rather than have a conflict about it they had struck it out. In paragraph 14 they commented upon the 5th and 6th clauses of the bill; as they were both struck out it was not necessary to mention them. By their 16th paragraph they strongly objected to the alterations in the existing law proposed by clauses 7 and 8. That raised a very distinct point, to which he must briefly refer. The Gaslight and Coke Company's Act of 1868 gave them a right to recover money due for a supply of gas in a summary manner. They had power granted to them by Parliament to avail themselves of what was known as Jarvis's Act, which was an Act of Parliament conferring a summary recovery of small debts by process before a magistrate. This remedy was, however, only available within six months after the contraction of the debt. The process was found to be a most summary and expeditious means of obtaining small debts. But there were persons who, after consuming gas, took themselves off, and made

it impossible for the company to discover them within the six months; and the object of the clause was to extend that time, and enable the company to avail themselves of the process whenever the delinquents were discovered. He knew of no reason why the Metropolitan Board should object to this, as it was a clause in the interest of the public; because all losses which were incurred were so much in derogation of dividend. It was the stock cry of consumers, "Whatever you do which is calculated to decrease dividend while the companies are entitled to make 10 per cent. if they can earn it, is an infliction upon the public;" and therefore they were seeking by those means to prevent that loss. Nobody was interested in the matter except the delinquents, who would, if they could, shuffle out of the way for six months. Clause 8 was one of more magnitude—one of very considerable importance. The company asked that the 110th clause of their Act of 1868 should be read as if the words "Metropolis Gas Act of 1860," had been omitted. He would ask the attention of the committee to the Act of 1868. The last section but one of The Gaslight and Coke Company's Act of 1868 said that nothing in that Act contained should exempt the company or their gas-works from the provisions of the Metropolis Gas Act, 1860, or the Act for regulating measures, and so forth. The company desired that it should stand, "Nothing in this Act shall exempt the company or their gas-works from the provisions of the Act for regulating measures," leaving out the words "Metropolis Gas Act, 1860." The committee would now see the reason he had troubled them with history of the legislation in 1868. The bill brought into Parliament in 1868 contained the 110th clause as it now stood, but did not contain the present 109th clause. He should just have to remind them of what he had already mentioned. The City Gas Act, 1868, passed through committee a few hours before the Chartered Bill was discussed, and as they were bound in the City by that Act, they also agreed to apply it to their district outside the City, to make their legislation uniform. In accordance with their acceptance of that principle, they inserted in their bill clause 109, which had the effect of extending all the amendments of the 1860 legislation into the metropolis wherever they were supplying it. But at the same time they omitted to strike out clause 110, which had stood in the bill before the City Gas Act was discussed. This was the result of a simple oversight, but its consequence had been that by not striking out clause 110, clause 109 had been rendered abortive. Here was an illustration of one of the difficulties that had occurred to the company. By the general Act of 1868, amongst other things, certain portions of the legislation of 1860 were repealed, and a new mode of dealing with gas was enacted. There were to be examiners of gas who were to test for illuminating power and purity, and who were to find out how far the companies were capable, with due management, to effect a certain amount of purity in their gas; they were also to prescribe from time to time the amount of impurity to be tolerated. The 1860 Act said there were not to be more than 20 grains of sulphur in 100 cubic feet of gas, but the 1868 Act left the quantity to be determined by the referees. In consequence of the retention of the 110th clause, the company found themselves in the following position:—The opulent parish of St. George, Hanover Square, were sued by the company for £2160, the amount of their account for public lighting. They paid into court a sum of £1782, and disputed their liability to pay any more. It subsequently turned out that there were rather more than 20 grains of sulphur in 100 cubic feet of the gas, and therefore they disputed our right to recover the price of it, relying upon the 110th section in support of their view. They said: "It is perfectly true that your 109th section has applied the City Gas Act—as amending the legislation of 1860—to our district, and it is quite true that if that 109th section stood alone, you would be entitled, subject to the supervision of these inspectors, to send your gas in as you have sent it in; but inasmuch as section 110 undoes all the legislation of section 109, we shall avail ourselves of that, and we think that we have a good point of law, and we shall fight you." The result was the company were beaten, and the matter went by appeal to the Exchequer Chamber, where that view was upheld. The learned serjeant could not complain of that, for it was law. He did not suppose the petitioners wanted the company to take out the 109th clause, and deprive the public of all the benefits of the Act of 1868, nor that they wanted to drive them into the comparative absurdity of having one species of legislation in the City of London, and another contradictory system in the metropolitan parts of their district. But that was the position into which they had drifted; and it would be for the committee to say whether they would not now take the opportunity of putting that matter straight. Their friends the Imperial Gas Company, when before Parliament the following year, had a special clause inserted in their own Act, the 32 & 33 Vic., cap. 128, to the effect that nothing in that Act contained should repeal or alter any of the powers or obligations of the company as defined by the Acts in force relating to gas, save as by that Act provided. All, therefore, that the company now desired was to make that 109th clause an operative one. In paragraph 17 of their petition they complained of clause 10 in the bill. The board did not like them to carry their coals by their own ships. He (Serjeant Sargood) really could not understand that, except that it was an ingenious way of always objecting to everything. By one of their recent Acts the company were allowed to raise another £1,000,000 of capital, and it would have been unreasonable for them to come and ask for further capital. The petition of the vestries objected that this capital could not be applied to the purpose of buying ships; but that question had been discussed and decided, for Parliament had granted them power to raise the capital for the purposes of their undertaking. The learned counsel then proceeded to call the witnesses in support of the bill.

Mr. *J. O. Phillips*, examined by Mr. GLYN.

I am the secretary of The Gaslight and Coke Company. We supply common 16-candle gas at 3s. 9d., and cannel gas of a superior quality at a proportional price. Most of our coal comes from Newcastle, the average price delivered at the retort-house in 1868 being 17s. 9½d., and for cannel coal in the same year 34s. 2½d. Roughly speaking, we use in the course of a year about 500,000 tons of all sorts. Almost the whole of it is brought to us by water. We are at present dependent for its carriage upon the coasting vessels of private owners. Freights fluctuate a great deal. In the winter they are naturally the highest. After stormy weather it often happens that ships are detained in the North, and then a great many come at one time. There is a difficulty in unloading them all at once, and demurrage has to be paid if they are not unloaded. This amounts in a year to a serious charge, something like £1200 at the present time. Supposing we had our own ships to carry coal, we should want about eight of 900 tons each. I think that would be a cheaper mode of carriage to us than the present one. The size I have mentioned is the ordinary burthen of the ships now employed in carrying our coal. A well-formed ship would make from 60 to 65 voyages in a year to and from Newcastle. Each vessel would carry from 60,000 to 65,000 tons of coal per annum. Ten years ago the price of such ships was £13,000; now they cost from £15,000 to £17,000 each. The normal rate of freight per ton of coal is 5s., but at the present time it is not less than 6s. per ton. From my knowledge I can say that coal ships pay something like 20 per cent. on an average. I think there is no necessity for paying, as we now do, at least 5s. per ton for freight to private owners, but a 4s. freight in our own ships would cover all charges throughout the year. That will save us 1s. per ton. I consider on the whole that it would be a great advantage to the company to have their own ships. We should economize in freight, and after payment of all expenses we should be able to realize a little profit, which would go in aid of the general dividend, and so assist in the reduction of the price of gas. At present, under the company's private Acts, there is a power to recover money under Jervis's Act. We lay an information before a police magistrate, and he grants a summons, the cost of which is 1s. The debtor is served by a policeman, who appears in uniform, and which frequently has the effect of inducing the debtor to pay the account. If not paid, the demand is made before a magistrate, who makes an order for payment. This proceeding must, however, take place within six months. If we fail to find the debtor, who generally moves out of the neighbourhood for a period of six months, we either lose our money altogether, or have to adopt a much more tedious and expensive process by applying to the county courts. We want a power now to recover this debt after six months. We should like to have a power to recover our debt by this simple process, *whenever* we have found where the debtor resides. With reference to clause 8, I remember the legislation of 1868. In that year a bill was promoted by the consumers and one by the Corporation of London, giving them power to make independent works for supplying the whole of the City. There was at the same time a bill of The Gaslight and Coke Company; in fact the whole supply of gas to the metropolis was involved. The end of the matter was that Mr. Cardwell's committee proposed certain terms which were accepted. The corporation held their bill in suspense until our bill, containing all Mr. Cardwell's suggestions, was passed; then the corporation withdrew their bill, and the other two bills became law. By the 109th section of The Gaslight and Coke Company's Act, the company are made subject to the operations of the City of London Gas Act over the whole of their district, outside as well as inside the City. When Mr. Cardwell determined to grant the City of London Gas Act, he previously required us to submit outside the City to all its terms. The 110th clause was in the bill when originally introduced; it was one which rendered us subject to the provisions of all General Acts passed, or to be passed in the future; and the clause which was inserted, and which is now clause 109 of the Act of 1868, was intended, I believe, to supersede clause 110. Clause 109 was inserted at the instance of the Metropolitan Board of Works. The two sections are not consistent one with the other; and, after looking up the facts of the case, I have no doubt whatever that the fact of clause 110 remaining in the Act proceeded from an omission to strike it out on Mr. Parkes's clause 109 being inserted.

Cross-examined by Mr. PHILBRICK: The practical difficulty in the retention of clause 110 is that the judges have decided that whereas the Act of 1860 is, in almost the entire extent repealed, so far as our company is concerned, and superseded by the Act of 1868, in consequence of these two clauses, 109 and 110, appearing in juxtaposition, the Act of 1860 applies so far as penalties are concerned.

Mr. PHILBRICK: Is the committee to understand it is because you want to get rid of the penalties of the Act of 1860?

Witness: No.

Serjeant SARGOOD said it would be fairer that the solicitor should be examined on these points.

Mr. PHILBRICK: Will you tell us where you find the difficulty?

Witness: The Act of 1868 also provides penalties of a very stringent character, but it does not provide any penalty in express terms, so far as I can recollect, with reference to the presence of sulphur. The Act of 1860 provides that no more than 20 grains of sulphur is to be contained in 100 cubic feet of gas, and if they had they should pay a penalty. That of 1868, on the other hand, says the question is to be referred to the gas referees to determine what shall be the maximum of sulphur to be allowed in the gas. Up to a recent period the board of referees have been engaged in investigating this point, and they have only recently fixed the maximum. That maximum is 20 grains, the same as was provided by the Act of 1860.

Mr. PHILBRICK: Is there any practical point of inconvenience that has occurred to you besides this question of sulphur?

Witness: I am not aware that there is. There are many provisions in the Act of 1860 which are still in force, notwithstanding the Act of 1868.

Mr. PHILBRICK: How many of the summonses under Jervis's Act do you use in the course of a year?

Witness: I cannot say with anything like certainty, but I estimate about 50 each quarter.

Mr. PHILBRICK: How many cases have occurred in which you have not been able to avail yourselves of this process by reason of the period having expired?

Witness: I cannot tell you the number. I only know the fact from objections having been taken by a presiding magistrate, that the period had expired. Our bad debts go to show that we lose a good many hundreds a year. They amount probably to something like £500 a year. We should summon people from all parts of the kingdom if we have the power.

Mr. PHILBRICK: Let me ask you as to clause 3. This will be an entirely new business of your company. Are you aware of any gas company under the general Gas Acts that has done the same?

Witness: I think our friends, the Imperial, have a power in one of their old Acts. I am only speaking from memory, and am open to correction; but even if I find that is not so, I do not see that is any reason why we should not do so. One essential part of the success of a steamboat is that it should have good despatch, and we can ensure the discharge of cargo at this end because at our place at Gallions Reach we have a very large pier and steam lifting machinery, which enables us to clear a 1000-ton ship in 10 hours, and we can clear two such at the same time. We have got leave to extend our pier, to such a size as will enable us to clear five 1000-ton ships at the same time; but unless we have power to enter into contracts with some one in the north of England who shall load the ships—either a railway company or a colliery company, or so forth—we cannot ensure that a ship shall get her coals with the same rapidity there as we can discharge it here. As to the proposed saving of 1s. per ton, the board of directors have been watching for years past the progress of the navigation on the eastern coast proceeding from one point to another, and have had information from time to time as to what dividend well-regulated, well-found ships pay. The price of coal is now very high indeed; the price of gas is very low, its illuminating power is required to be very high, and its purity is required to be very great; so that, with all these things put together, it is necessary for us to exercise the very utmost vigilance, and to turn over every stone that we possibly can with a view to any economy, even the smallest, or any gain which shall help dividend.

Mr. PHILBRICK: Then, in point of fact, because the business of a freighter of coal from the collieries to the gas-works is thought to be profitable, does the company desire to be authorized to carry that on, in order that it may add the profit to the present revenue.

Witness: Primarily so, no doubt; the object being to benefit the public.

Mr. PHILBRICK: You mean because Parliament says that you must not take more than a fixed amount of dividend. I think you have scarcely answered my question. Has any detailed scheme or plan been submitted by the board of directors with regard to embarking in this freighting business?

Witness: No more detailed plan than this, that they accept the statements of myself and the other officers of the company, and they see for themselves that we have a very large trade, which occupies permanently and steadily right through the year no less than seven or eight large steamers; they know pretty accurately what these steamers will cost; they know that if they carry the coal themselves—being their own paymasters—there will be no bad debts incurred by the ships. They know that if they can make any arrangement with any people in the North to give good despatch there must be all the elements of success; and with all those elements of success which they have been watching for the last seven or eight years, they have found the ships which they have been chartering have paid the owners something like 20 per cent. per annum. We should require eight steamers of about 900 tons each, which is a very handy size. To purchase them £140,000 would be required, roughly speaking. Each ship would make, say, 60 voyages per year. A ship would carry 54,000 tons; taking that at 4s. per ton, it would represent £10,800 a year earnings. The working expenses would come to—and I have taken the highest calculations—about £7500 per year. I should propose to charge £1000 per year for each

ship for depreciation; that would leave £2300 net profit, which would be as nearly as possible 13 per cent. on the outlay after paying insurances. Ten per cent., of course, would be the amount the shareholders would expect, and the odd 3 per cent. would go into the general profit for the benefit of the consumers, while at the same time we should be paying 4s. instead of 5s. per ton for freight. We obtained power to raise £1,000,000 additional capital last year, which is still untouched. Our works in hand are not so large as to require that capital for some years. We have been obliged to resume manufacture at Blackfriars this winter, having been compelled to desist from extensions during the last few months on account of the price of iron. None of our Newcastle coal comes by land, only the cannel going to our Kensall Green station. As compared with sea, the freight by railway is, I should think, absolutely double.

Cross-examined by Mr. COWIE: My calculations are based upon the fact that 20 per cent. is the average profit earned by ships carrying coals.

Sir JOHN DUCKWORTH (to Serjeant Sargood): Do you propose to get rid of all the unrepealed legistion of 1860?

Serjeant SARGOOD: No; only to take the 1860 legislation as it stood. Then came the Act of 1868, which was intended to be an amendment of that Act all over the metropolis; but by an arrangement made at the last moment the amendments of it were confined to the City, and instead of being a metropolitan amendment Act it was called the City of London Gas Act. Therefore, so far as it altered the existing legislation of 1860, it was altered only within the City of London.

Mr. CRIPPS: There were only three companies before the committee.

Sir JOHN DUCKWORTH asked if the company wanted to do more than apply the law of 1868. It seemed to him that they proposed altogether to get rid of the Act of 1860.

Serjeant SARGOOD said that so far as the City of London was concerned, the Act of 1868 left the Act of 1860 in full force, except where it altered or amended it over the whole of the metropolis. The object of Mr. Cardwell was that, having altered the Act so far as affected the City, it should be altered so far as affected the metropolis in the district which the Chartered Company were supplying. To that extent clause 109 took effect, and if that remained without clause 110, it would simply be that the Act of 1860 remained in force all over the metropolis, except where the Chartered were supplying gas, and then it would be amended by the Act of 1868. The effect of clause 110 being left in was, that in the portion of the metropolis served by the company, notwithstanding the amendments adopted, they were under the old law. Mr. Parkes, who was agent, on the City Bill, for the Metropolitan Board of Works, would tell the committee exactly how the mistake occurred.

Sir JOHN DUCKWORTH: If those words "Metropolis Gas Act, 1860," are struck out of your clause, everything of the Act of 1860 would remain, as I understand you, except those things that are in the schedule of 1868?

Serjeant SARGOOD: Yes; and then we get uniform legislation in respect of all the districts supplied by this company. Clause 8 does all that is necessary in our 1868 bill.

Re-examined by Serjeant SARGOOD: I know of no gas company that consumes our quantity of coal, or with the wharf accommodation that we have. The million of money we were authorized to raise in 1872 is not restricted to any works, but would be available for the purposes of the company, and would be quite applicable to the expenditure of buying a few ships. A very small company would never dream of buying ships; but when you come to one consuming 500,000 tons of coal a year, in the interest of economy it would be to the advantage of the company that it should have the traffic of coal in its own hands. Our paid-up share capital amounts to £2,902,470; our authorized share capital is £4,150,000, and borrowing powers, £1,063,500; together, £5,213,500. Up to 1868 we had expended £2,150,569, and since 1868 it has amounted to £3,368,228. Recent legislation has granted capital to us in anticipation of the enormous requirements that our continued amalgamations will bring about.

Mr. *C. H. Parkes*, examined by Serjeant SARGOOD.

I am the official auditor appointed by Government for auditing the accounts of gas companies. In 1868, and previous years, I was interested in the gas fight, as it was called. I was then acting on the behalf of the City in promoting a bill for establishing gas-works of their own. There was also a general bill brought in by the Government with reference to the metropolitan gas supply, called the Consumers Bill, and I was acting on that, as also in opposition to the Chartered Bill, on behalf of the Metropolitan Board of Works and other parties. In 1867 the result of a lengthened inquiry was that Mr. Cardwell would not put the pressure of legislation immediately upon the companies, but made a very special report and intimated strongly that the local authorities should bring in a bill of their own for the purpose of supplying gas. In 1868 the Chartered Company brought in a bill, and there was also what was termed the Consumers Bill taken up by the Government; and then the corporation came in as against the company if they would not do what the committee wanted, to take power to make their own gas. The interests of all the companies in the City being thus jeopardized, they agreed to submit to Mr. Cardwell's terms, and the result was the compromise the learned counsel (Serjeant Sargood) has mentioned. In framing the clause 109, I assumed that it practically would be as applicable to the Chartered Gas Company as the clauses of the Gas Act, 1860, which were repealed in the City of London Gas Act. A little complication arose because we did not know whether the City of London Gas Act would pass, and that clause (110) was introduced with the intention of reviving the bill in the House of Lords, if the City Bill did not pass. An undertaking was given by the agent for the Chartered Bill, that the whole of the clauses in the bill should be inserted in the Chartered Bill, and the last clause (110) was left in its then state, instead of having qualifying words inserted, which would have restricted the operation of the City of London Gas Act to those portions of the bill which were unrepealed by that Act. That is the way in which the error arose. The two things, the City of London Gas Act and the Metropolis Gas Act, were inconsistent. I was only supposed to draw a clause, 109, which I did. This 110th clause was useless directly the City of London Gas Act passed. I can show that the two cannot work together, and am prepared to go through every clause for that purpose. It was a pure oversight that clause 110 was not struck out.

Cross-examined by Mr. CRIPPS: I have a tolerably perfect recollection of what was intended. My recollection is that I was asked to draw the clause to apply the City of London Gas Act in its entirety, in all its appeal clauses. The clause I drew was clause 109.

Mr. CRIPPS: There were various things in which the City of London Gas Act, 1860, was still to continue in operation under any circumstances?

Witness: Yes, and they would, because the City of London Gas Act, 1868, kept alive all its provisions except those that were repealed. The City of London Gas Act was by clause 3 intended to apply to the whole of the metropolis.

Cross-examination continued: Unfortunately the whole of the Act of 1860 is kept alive, and made applicable to the company, notwithstanding the application of the Act of 1868, which repeals only a portion. The judges have construed the words, "Nothing in this Act contained shall except the company or their works from the provisions of the Act of 1860," as keeping alive, as against this company, the whole of the provisions of the Act of 1860.

Mr. CRIPPS: The whole question is, is it not whether this Act is an Act supplementing the City of London Gas Act, and not repealing it except where it is expressly repealed, or whether the Act was intended to repeal by implication certain provisions of the Act of 1860?

Witness: That is the very question. The question is simply this, what are the company subject to? Are they subject to the City of London Gas Act, 1868, with the alterations made in the Gas Act of 1860 by that Act, or are they subject to the two together?

Mr. CRIPPS: Could you give me an illustration of the mischief which you suppose is to be worked by the 110th section standing as it is?

Witness: I suppose, if you allow it to stand as it is, you might have section 7 of the Metropolis Gas Act of 1860 come into operation with regard to a complaint made by the 20 inhabitants?

Mr. CRIPPS: Let us take your case. Section 7 states that on complaint by the Metropolitan Board, or any vestry or district board, or by not less than 20 inhabitants, of the quality or quantity of gas supplied, it shall be lawful for the Secretary of State to appoint an inspector to inquire into the ground of such complaint. Is there anything in that section inconsistent with what can be done under The Gaslight and Coke Company's Act?

Witness: Yes; there is a different machinery. There are gas examiners appointed, whose express duty it is to test daily the quality and purity of the gas. There are certain penalties attaching to it, and the two things are inconsistent.

Mr. CRIPPS: You would not, of course, say that the districting under the Act of 1860 was to be repealed?

Witness: No.

Mr. CRIPPS: Then I quite understand you, that where you find two clauses which, in your opinion, will not work together, as you say (which is a matter of opinion), you think then that the subsequent Act was intended to repeal the former one?

Witness: The subsequent Act did. You will find that section 7 is repealed in the schedule of the Act of 1868. Two companies have also been to Parliament since the City of London Gas Act—the Imperial and the South Metropolitan—and they have not applied that Act by incorporation, but they have taken the provisions of it. That was in 1869.

Mr. CRIPPS: The Act of 1869 differed in many material respects from the City of London Gas Act, did it not?

Witness: The general machinery was the same, but there was a difference in the quality of the gas.

Mr. CRIPPS: Very material alterations were introduced?

Witness: Yes, but not in the machinery, what you may call clauses for the protection of the public as regards purity and illuminating power. They are precisely the same as regards the referees—the gas examiners—or as nearly as possible.

Re-examined by Serjeant SARGOOD: The Metropolis Gas Act applied to all parts both within and without the City. If it had been carried out as brought in, it would have been a metropolitan Act. Clause 109 imposed the Act of 1868 on the Chartered district.

Serjeant SARGOOD: And if section 110 is left in, saying that they are to take the 1860 legislation, you think that they are practically deprived of those benefits?

Mr. CRIPPS: You cannot mean that.

Witness: Well, you have got two inconsistent Acts.

By Sir JOHN DUCKWORTH: The Act of 1868 applies to the City, and it was intended by the private Act to extend its provisions to those parts of the Chartered district outside the City; but the effect of the judges decision, as I understand it, is that the Act of 1860 is in full force still.

Mr. *Edwin Bedford*, examined by Mr. GLYN.

I am one of the solicitors to The Gaslight and Coke Company. I acted as their attorney in an action brought by the company in the Court of Queen's Bench to recover £2160 due from the parish of St. George, Hanover Square, for the supply of gas to the public lamps during one half year. It also included charges for repairs to lamps. £1787 was paid into court by the defendants, who disputed their liability to pay more. In February, 1871, the action came to a hearing, the company's case being argued by Mr. Hawkins. It was found that the opposition of the parish arose chiefly because they said the gas was improperly charged with sulphur, and as that indirectly was governed by the Act of 1860, or those clauses of that Act which we contended were repealed, a special case was directed to the full court to ascertain whether or not those sections still applied to the plaintiff's company. That special case came on for hearing in May, 1872, before the full Court of Queen's Bench, which court, without calling upon the defendants, held that those sections of the Act were still in force; and it then went to Mr. Manisty to say whether or not, those sections being in force, the company could claim the whole or part of the balance—in other words, whether we were to be paid for the gas which the parish consumed, and if so, how much. The company appealed to the full Court of Exchequer Chamber against that decision so far as related to the legal question. The case came on for hearing last February, and was again decided against the company. The judges held that there could be no question that but for that 110th section it was clear that the Act of 1860 had been repealed in a schedule in the Act of 1868; but that the effect of the 110th section in our Act had been to let in those sections again; at any rate, so far as our undertaking out of the City was concerned. And as this was for gas out of the City they held that we were still subject to the provisions of the Act of 1860, although they had been repealed by the Act of 1868. It was shown to the judges how it would work, but they said naturally, "We are sitting here to administer the law as it is."

Cross-examined by Mr. CRIPPS: As there is no appeal from the Exchequer Chamber, this is the law as interpreted by the judges at present.

Serjeant SARGOOD said that was the promoters case.

WEDNESDAY, APRIL 2.

Mr. CRIPPS, who appeared for the Metropolitan Board of Works, said that there were three distinct matters upon which the board appeared to be at issue with the promoters of the bill. One was with reference to clause 8, that proposing to read a section of their Act of 1868 as if the words "the Metropolis Gas Act, 1860," were omitted; another was as to the expediency of the more extended powers they thereby desired to get under clause 7 of their bill; and the third was the more important point with regard to clause 3 of their bill, in which they sought a power, though somewhat less than when the bill was introduced, still a power which the board thought extremely objectionable. As regarded the first point, the alteration by their section 8 of the 110th clause of their former Act, but for the evidence of Mr. Parkes they could not have been entitled to ask for alteration, for Acts of Parliament once passed could be repealed only in two ways—either by direct statement that such and such a clause should be repealed, or by necessary implication if the terms of a subsequent Act were so inconsistent with the former that it obviously could not have been the intention of the Legislature that both clauses should stand. That it was repealed directly there could be no pretence; the question whether it was repealed indirectly by necessary implication was discussed at some length by the judges in the Court of Exchequer Chamber, and they were unanimously of opinion that there was no repeal by necessary implication, and that the second Act and the first Act were consistent. That view he (Mr. Cripps) would have contended very strongly for, but for Mr. Parkes's evidence; but when Mr. Parkes came before the committee and told them that he recollected the circumstances, and that it was a mistake and an error, he had no means whatever of disproving that statement. The next point the board desired to call attention to was the 7th clause relating to the recovery of money due to the company for the supply of gas, or for the use or repair of any meter, which, notwithstanding the provisions of any Act to the contrary, might be taken by the company at any time after such money became due.

The CHAIRMAN: We have no doubt on that subject, the repealing of this 7th clause. The general law must prevail.

Mr. CRIPPS then proceeded to deal with the 3rd clause. He said that it was

desirable that the committee should know what the promoters intended in the first instance. It appeared to have been, however objectionable, a consistent section in the first instance, but to be an entirely inconsistent and absurd section as altered by the promoters. They desired to become colliery owners and workers of mines, and so to have the manipulation of the coal from the time it was first raised from the mine to the time it came into their hands as gas producers. The original objects of the bill were to permit the company to purchase their own ships and lighters for the purpose of bringing the coal thus raised to their works. They (the Metropolitan Board) thought it extremely inexpedient that a company, the object of which was the manufacture and supply of gas in London, should be mixed up with a business of a totally different character from the manufacture of gas. It might be that their directors were perfectly qualified to superintend the manufacture of gas, and all questions concerning the supply of gas to the consumers; but it was entirely foreign to that purpose to undertake duties which required different qualifications, different training, and essentially of a different character, such as the business of being colliery owners, and superintending the working of mines, and being, in addition to that, shipowners. It was sufficient, he trusted, to show the inexpediency of this proceeding, to say that it would be a matter absolutely new in the history of gas legislation. One of the witnesses had stated that he believed there was something of the kind in some old Act of the Imperial Company. That had been looked to, and it was a mistake; and what was there, was the strongest possible argument against the power asked. It was not in an old Act, but in a recent bill. The Imperial Company did desire to have that power, but previously to the bill going before the committee they withdrew the clause. The subject had, therefore, been in the mind of the Imperial Company; but upon consideration it had not been thought an expedient power to ask for, when the committee considered the number of gas companies which had been established for years past—many of them in important seaport towns—if there had been anything at all cheaper as the result of their being shipowners, no doubt the matter would have been attempted. It certainly was introducing for the first time a very great innovation, and as the Metropolitan Board thought a very dangerous innovation. They thought that everybody should retain the business for which they had special qualifications, and that the colliery owners and the shipowners should be allowed to bring the coal to the gas companies to manufacture. It could hardly be supposed that any considerable profit could arise to the gas company by being owners of ships. They had no necessary qualifications for that, but they were very good customers, took large quantities of coal, and their pay was certain, and parties would be willing to deal with them upon very favourable terms; and the Metropolitan Board thought it far better that they should remain, not speculating at all in that matter. The companies thought it would be a gain. He (Mr. Cripps) was not prepared to say that possibly it might not be, but it might result in a considerable loss, and if that loss should occur, the company would not be the sufferers, but the consumers of gas in the district supplied by them. It really was a question whether it was desirable to embark in a business of this nature, in the interests of the consumers of gas, for the companies. That clause had been made very inconsistent by striking out the first portion of the clause and leaving the second in, for he (Mr. Cripps) did not know why the company were at all less competent to act as colliery owners than as shipowners. It would have been more intelligible to have said that, being gas producers, they ought to be entitled to manipulate the coal from the time it was raised from the earth. But they had abandoned that, and the whole thing had, therefore, been substantially given up, because the argument against the one was exactly the same as against the other. They then came to a point which, under any circumstances, appeared to be a fatal one. The company said that they had a general power, under their Act of 1872, for raising money. The million of money was only given them on their stating for what they required it. It was granted for the purposes of a gas company, and merely because they were a gas company under certain restrictions were they allowed to raise that money and pay 10 per cent. dividend upon it. The more they expended to benefit their own purposes the longer was the benefit to the consumer postponed. Parliament never intended, in giving them that million of money, that they should be enabled with it to deal in ships and get 10 per cent. profit out of the business. The estimate for that purpose ought to have been laid before Parliament when they applied for that capital. But nothing of the kind had been done, and if the committee granted them the power they now asked for, it would be diverting some of that million from the purposes for which Parliament alone was induced to grant it. Would it enable the company to supply gas cheaper if they were entitled at any rate to 10 per cent. upon the capital?

The CHAIRMAN: Is there any express prohibition to their spending money on ships in the Act of 1872?

Mr. CRIPPS said there was not, but there was no power to do so. That million of money was granted upon an estimate showing that they would require it for the purposes of their undertaking, and not for any such purpose as was now contemplated. Indeed, were it not for the Act they were now seeking, no director could by any possibility sanction any such outlay; it would be *ultra vires* altogether, and any shareholder of the company might file a bill to restrain anything of the kind, or recover back money so expended. If it was right that they should have that power, it was also right that the money should be specially appropriated, and power given them to raise it for that purpose. But that was not the case here. He (Mr. Cripps) did not see why they should not also become ironworkers, because they used pipes to a considerable extent. But there was really one sound principle: they were a gas company—let them remain so, and not go out of that line of business. The point was an important one, because if a precedent of that kind were made, no doubt it would be attempted to be followed by other companies. What was done by the committee for the first time would be an important precedent, and he thought a very dangerous one, but one which would have to be fought over and over again before the committees of Parliament.

Mr. DANGERFIELD said he appeared on behalf of no less than four vestries and five district boards of works, representing the greater part of the city of Westminster, and also many other local boards outside that city, embracing altogether 21 parishes, and, in deference to the strongly expressed feelings of those whom he represented, he hoped the committee would strike out the remainder of the 3rd clause, and not allow the company to become shipowners. With regard to the 8th clause, if the committee allowed that to be struck out, they would deprive the local authorities of all the protection they had at the present moment. The gas companies had very great power and authority, which ought not to be increased. Previous to 1860, the local bodies and consumers could take their gas from any company in the metropolis who were willing to supply it, and therefore there was some control over those companies. The companies then coalesced, and divided the metropolis between them, which the consumers considered a great evil, and they brought in a bill for the purpose of controlling the action of the companies; but owing to the heavy purses of the companies, which protracted the proceedings for a very long time, the promoters were obliged to take it in a very different shape from that in which it had been introduced. By the decision of 1872 the consumers of gas had been shown to be entitled to the benefit of the Act of 1860, with the exception of certain clauses which had been scheduled to the Act of 1868, but left the rest of that Act for the benefit of the consumers; and it had been held, therefore, that where these clauses were not inconsistent they were still in force. There was nothing to repeal them, and the vestries contended that if the course pursued by this bill were adopted, it would deprive them of that benefit which the law at present gave them.

The committee-room was then cleared. On the parties being readmitted,

The CHAIRMAN said that the committee were of opinion that the preamble was proved, at all events that part referring to the amendments of various Acts; that they had altered the 3rd clause of the bill, which would read thus: "The company may from time to time purchase, maintain, and use all such collier ships, lighters, and vessels, as they may require, or may deem necessary to the proper carrying on of their undertaking;" that they had struck out clause 7 (that relating to the extension of time under Jervis's Act), but that they would allow clause 8, and with the words "Metropolis Gas Act, 1860" omitted, to stand. Clause 10, 11, 11A, and 12 stood.

THURSDAY, APRIL 3.

IMPERIAL GASLIGHT AND COKE COMPANY'S BILL.

Mr. DENISON, Q.C., and Mr. VAUGHAN RICHARDS, Q.C., appeared for the promoters; Serjeant SARGOOD and Mr. COWIE for The Gaslight and Coke Company; and Mr. PHILBRICK for certain vestries and district boards of the metropolis who had petitioned against the bill.

Mr. DENISON, in opening the case for the promoters, said this was a bill to authorize an amalgamation between the Imperial Company and all or any of the other metropolitan companies. After referring to the parliamentary inquiries of 1866, 1867, and 1868, on the supply of gas to the metropolis, and the recommendations therein contained for the amalgamation of the several existing companies, the learned counsel proceeded to say that the promoters of the present bill were not themselves in favour of the principle of amalgamation, and were not the promoters of the bill from any fancy of their own. They had come forward in obedience to the recommendation of the committee of that House, and the desire of the Board of Trade, the Corporation of London, and the Metropolitan Board of Works. The Gaslight and Coke Company had already amalgamated with five other companies on the north side of the Thames, and there remained only four with which, if this bill were passed, the Imperial Company could form alliances—viz., the Commercial, the London, the Ratcliff, and the Independent. No arrangements for the purpose had been made with either of these companies at the present time, but, looking at the map of their respective districts, it seemed clear that if they were to be amalgamated at all it must be with the Imperial Company. Whether or not this should be carried out was notnow to be decided, because no compulsory powers were sought in the present bill. All that the bill proposed to do was to authorize any such amalgamation hereafter as the Board of Trade might approve. The only petition of importance against the bill was the petition presented by the Chartered Company, whose contention was that, inasmuch as they themselves were authorized by Parliament in 1871 to amalgamate with all other companies, therefore the Imperial Company ought not to have a similar option. It appeared that in 1868 the circumstances of the Chartered Company required them, unwillingly, to submit to the terms and conditions laid down by Mr. Cardwell's committee. They said it would ruin them, for a time at any rate, and he thought it would be seen that they were not far wrong. Indeed, as to a good many things, it was now seen that the predictions made by the companies in 1868 were a good deal more fulfilled than those of Mr. Cardwell, who, though a great legislator, was a bad prophet, as was evident from his railway as well as his gas legislation attempts. The Imperial Company, not being at that time in such extremities, refused to accept Mr. Cardwell's terms, and in the following year they applied to a wiser and better committee, who passed their bill very much in the form in which it was presented. The Board of Trade, however, who seemed to think their mission on earth was to worry the gas and other companies, got the bill recommitted to a larger committee. The bill was passed by that committee with some moderate alterations, the dividend on the new capital which they proposed to raise being limited at their own suggestion to 7 per cent., instead of 10 per cent. which the Chartered Company were allowed on their new capital; so that the Imperial Company thus made a present to the consumers of £39,000 a year. On the other hand, they obtained from Parliament a standard of 14 candles illuminating power for their gas instead of 16, and the concession was made to them of a right to create a reserve-fund to the extent of 5 per cent. of their capital. The wisdom of that arrangement was now apparent enough, inasmuch as all companies without a reserve-fund were in a state of disturbance and agitation; some of them were in partial ruin, and some were in Parliament this session for power to raise the price of gas; and the Chartered Company were themselves applying to commissioners appointed by the Board of Trade for the same purpose. With reference to the question of capital, that of the Chartered Company was much larger than that of the Imperial—the former having a share capital of £4,150,000, and the latter £2,860,000. The maximum dividend which the Imperial Company were authorized to pay amounted in the gross to £247,000 per annum, that of the Chartered to £415,000. The Chartered Company had amalgamated several companies, to two of which they had guaranteed 10 per cent. dividends, and no doubt other companies would be willing to amalgamate with such a company on those terms; but it became a very serious question to their ordinary shareholders whether they should increase the risks which these guarantees imposed upon them. Under these circumstances, it seemed as though the general powers of amalgamation which the Chartered Company obtained in 1871 were of little value, and the question, therefore, was whether further amalgamations should cease, or powers should be given to those companies to amalgamate with the Imperial, which was the next largest company. In every point of view the Imperial compared favourably with the Chartered. They were not burdened, as against the consumers, with a 10 per cent. dividend on all their capital, before a reduction in the price of gas should take place; they had not been obliged to draw upon their reserve-fund, which amounted to £81,500, to make up their dividends, except to a very small amount, and they had a contingency-fund to the extent of £50,000. The company were anxious it should be clearly understood that they were not there as the advocates of amalgamation as a principle, but merely to offer the only possible means of amalgamation if the committee should think it was a right and desirable thing to do. To this proposal the Chartered Company objected, and they petitioned against it, denying the expediency of the proposed powers, and submitting that they would be detrimental to the interests of the consumers, and a manifest injustice to themselves. [The learned counsel read and commented at length on the main allegations of the petition, a summary of which was given in the JOURNAL of the 25th of March, p. 223.] He then referred to the petitions presented by the vestries and district boards, who alleged that the powers and provisions of the bill were injurious to their interests, and ought not to pass into law. He said it had been decided over and over again that the vestries were not the proper authorities to appear in opposition to a bill of this kind. The Metropolitan Board outside, and the corporation inside the City, were the bodies recognized by Parliament for the purpose, and this petition was only another attempt on the part of the vestries to get themselves recognized in the control of the supply of gas. The Metropolitan Board would have to be heard before the Board of Trade whenever any proposal for an amalgamation was made, and not the vestries. The St. Pancras Vestry had not such a peculiarly odoriferous reputation that they ought now to be added to the Metropolitan Board for the first time in the management of these matters; and as to the petition of the vestry of Paddington, he remarked that it was only a watered edition of the petition of St. Pancras, which it was not worth while to read.

Mr. Harry Chubb, examined by Mr. RICHARDS.

I am the secretary of the Imperial Gaslight and Coke Company, and have held that office for the last ten years and more. When I became secretary the Metropolis Gas Act of 1860 was in full operation, and regulated mainly the proceedings of this company. I am quite familiar with the gas legislation which

has taken place since 1860. The district of the Imperial Gas Company lies in the north of the metropolis. Our works are situate at Fulham, on the banks of the Thames, near Cremorne. We have a second station at St. Pancras, near King's Cross Station; and a third at Shoreditch, by the Hackney Road; and we are now erecting new works at West Ham, Abbey Marshes. That station is not yet in operation, although at the present moment it is capable of producing 2,500,000 cubic feet of gas in 24 hours. The remainder of the land there is laid out for works, ultimately to be erected upon it, capable of producing something like 20 millions a day. All the preparations were made in November last for commencing then to make 2½ millions a day, and the arrangements are for enlarging the works from year to year as the demand for gas increases, until the make reaches 20 millions a day, which will be about eight years hence. The demand for gas in the company's district increases regularly at the rate of from 8 to 12 per cent. per annum. On Dec. 24 last upwards of 20 million feet of gas was sent out from our other three stations combined. We have the means of connecting those stations. There are the most complete arrangements, by connecting mains and valves, for working them separately or jointly, or for one or two stations wholly relieving the other. The Chartered Company have seven stations. In entering London from the Beckton station, the mains of that company run through the Commercial Gas Company's district, and on entering London from West Ham the mains of the Imperial Company run through the Commercial Company's district, so that whether the latter company joined the Imperial or the Chartered, the mains of the other company must still pass through the district. There are two mains from the Fulham works running the whole length of the King's Road and up Sloane Street (the London Company's district), in order to reach our own district, which commences with Hyde Park. They are each 3 feet 6 inches in diameter. There is another large main from the Fulham works, which passes along Earl's Court and Palace Gardens, and so gets into the Imperial district. This main passes wholly through what was the Western Company's district, and is now the property of the Chartered Company. From the Fulham works there are three large mains, altogether 7½ miles in length, running through other companies districts. There is not the slightest inconvenience from this fact. On the contrary, by means of those mains the companies have been enabled to render mutual assistance to each other in emergencies. This was the case last winter on the occasion of the stokers strike. I remember the parliamentary inquiry which took place in 1866 before Sir John Trollope's committee on the metropolis gas supply. That was the time when amalgamation was first mentioned in connexion with the companies. Mr. Cardwell's committee, in the following year, recommended it. The report made by his committee does not distinctly recommend the number of companies between which the supply to London should be divided, but in the discussion which took place before the report was made, I think four was the number mentioned, of which the Chartered was one, and it was accepted by the committee as the best arrangement which could be made. The idea was that it would be better for the whole metropolitan area to be divided into four companies, two for the north and two for the south side of the Thames. It was never once mentioned or suggested throughout the discussion that the Chartered Company should have a monopoly of amalgamation; it never entered anybody's head. In 1868 the Chartered Company accepted the terms proposed to them by the committee which then sat on the City of London Gas Bill, but the Imperial Company could not accept the onerous conditions proposed to them. They were not under the same pressure of circumstances, and were able to wait. They strongly objected at that time to the whole theory of amalgamation. As a witness, I expressed an opinion against it, not seeing the great benefit or economy that would result therefrom.

By the COMMITTEE: The question at the time was, what saving would be effected by an amalgamation, and to what extent it should be carried out, with a view to economy in the manufacture of gas. The Imperial Company maintained, and I, as representing them, stated that there was very little economy to be effected by that means.

By Mr. RICHARDS: Great expectations were formed and expressed by many witnesses that if the companies were amalgamated, the cost of making and distributing gas might be greatly reduced, and as it was proposed that the maximum price the companies might charge should be reduced in proportion, it became necessary to protest decidedly against such a fallacy, and I did venture to explain that it was all a mistake to suppose that amalgamation would produce any such beneficial results. Since then the Chartered Company have absorbed three or four other companies, and they are now larger than the Imperial in point of capital. Since they have absorbed the Western Company they are also larger in rental by something like £70,000 a year. Not only was there a strong feeling expressed by the parliamentary committees of 1866, 1867, and 1868, in favour of amalgamation, but I have here a letter from the Board of Trade on the subject, dated Feb. 9, 1871, in which the president (Mr. Chichester Fortescue) invited all the metropolitan companies to come and see him on the subject of gas legislation. The companies had an interview with him, and considerable discussion took place as to whether the remaining companies should be brought under the operation of the Act of 1865. [Witness read the letter referred to, in which the president expressed a decided opinion in favour of amalgamation.] The Board of Trade have favoured these amalgamations, and they apparently believe still that they are advantageous to the public. It is evident that so long as the districts of the companies remain in their present disjointed and intermingled state, so long will agitation arise, as it will always be supposed that the companies can make and supply gas more economically if these districts were united under one management. The Board of Trade have a very strong feeling on the subject, and this feeling is indicated in the letter I have read. The Metropolitan Board of Works have presented a petition against this bill. In consequence of that petition, I wrote to their solicitor to ask what modifications they desired in it, and the proviso in the second section, for preventing the Chartered and Imperial Companies from amalgamating without permission of Parliament, was introduced at the instance of that board. Upon that being done they not only withdrew the petition, but it was an understanding that they would promote and support the bill. The only companies on the north of the Thames that may be affected by this bill, or that will have the option of amalgamating with the Imperial, are the Independent, the Ratcliff, the London, and the Commercial. I think those companies should have that option. This bill, if it becomes an Act, will not force them into amalgamation, it will only give them the choice, which they have not now, of joining with us; they already have the option, if they like, to join the Chartered. The Imperial Company have but one of their works in their own district—viz., those at St. Pancras. The Fulham works are in the London Company's district; the Shoreditch works in that of the Independent; the West Ham works are outside the metropolitan area, and the leading mains from thence pass through the Commercial district, in order to get to the Imperial district, which they are to supply. Our Fulham station has considerable advantages; coals can be brought to those works very readily by lighters on the Thames, coming direct from the ships in the pool. Prior to 1857 the district round those works was lighted by us, but the Imperial Company then gave up that district to the London Company, and took from them a portion of St. Pancras, which they had lighted. I think the outside companies should have the option of joining either the Imperial or the Chartered Company. They have had the opportunity since 1871 of joining the Chartered, and we have not interfered in any way, but they have not done so. I have had communications from some of those in authority in the Commercial Company on the subject of joining the Imperial.

Serjeant SARGOOD objected that these communications were not official, and could not be referred to.

Mr. RICHARDS: Do you know yourself of any reasons, in comparing the position of the Chartered and the Imperial Companies, why the companies may be likely to prefer one to the other?

Serjeant SARGOOD: I object to that question.

Examination continued: The Imperial Company at the present time are paying 10 per cent. upon their old capital, and 7 per cent. upon the new, which are their maximum rates. Their maximum reserve-fund is £81,250, and the actual reserve at the present time is £74,000 in round numbers. About £3000 was taken from that fund to make up the last half year's dividend. The cost to them of the stokers strike was over £21,000, so that but for that event they would have been able to pay their full maximum dividends without drawing upon the reserve-fund, and carry over a balance of £14,000 or £15,000. I have seen the Chartered Company's report and accounts for the past half year. The directors state in their report that "the evil effects of the strike have been heightened by the entry upon coal contracts at prices previously altogether unknown. These causes, therefore, have operated so to absorb and reduce the profits of the company that the directors, though availing themselves of their entire undivided balance of profit, are unable to declare a dividend for the half year at a higher rate than 9 per cent. per annum." It appears from their accounts that the amount applicable for dividend at that rate was £74,438 12s. 8d., which included the net cash balance which the Western Company brought to them on amalgamation of £33,042 17s. 2d., and also their own balance of about £4000 carried over from the previous half year.

Mr. RICHARDS: Do you think that a knowledge of these facts might influence any other companies who were invited to join the Chartered?

Serjeant SARGOOD objected to the question.

Mr. RICHARDS: Under the Chartered Act of 1871 that company had power to amalgamate with the Imperial?

Witness: Yes.

Mr. RICHARDS: Speaking as the secretary to the Imperial Company, do you think the Imperial would amalgamate with the Chartered under that state of circumstances?

Witness: Most decidedly they would not. There are a great many other points that would influence them. Of course the present state of their finances is very important, but there are many more points with reference to their capital account, and their preference and other engagements, which are equally objectionable.

Mr. RICHARDS: Can you suggest any reason whatever why the Chartered Company should have anything like the exclusive right of offering amalgamation to the outlying companies.

Witness: I can, on the contrary, see a great objection to their retaining that exclusive power, especially as it inflicts injury upon those other companies, and puts a stop to uniformity of control.

Mr. RICHARDS: Is there any passage in any resolution of Parliament, or any report of any committee, that in the least justifies the assertion than such an exclusive power was ever intended to be conferred upon the Chartered Company alone?

Witness: I do not know of any. I know the history of the whole proceedings, and I do not know of anything of that kind.

Mr. RICHARDS: The result of this bill, supposing it becomes an Act of Parliament, will leave the outlying companies just as independent as they are now, but with the option of going either to the Imperial or the Chartered, instead of the option of going to the Chartered only?

Witness: Yes.

Cross-examined by Serjeant SARGOOD: I agree with what Mr. Denison said that we are here in the discharge of a duty, and I have not altered my opinion as to the amount of economy to be effected by amalgamation. To this extent I do not think it is desirable, or that it will save the consumers the large sum of money which it was originally contended it would do. The reason we appear here is this, that the Board of Trade are desirous amalgamations should take place. Amalgamation is right in this respect, that it would bring the outlying companies under the control of recent legislation on metropolis gas supply. At present not one of those four companies have their gas tested officially, they are not subject to the orders of the gas referees as to the minimum of purity to be allowed in their gas, they have no public auditor to examine their accounts, and great suspicion arises that they are not acting fairly towards the public. So long as that state of things exists there is great agitation. The Metropolitan Board feel that the whole question is very unsettled, and are therefore exceedingly anxious to get uniformity of practice, the audit of accounts, and inspection of gas-works, so that all the companies shall be brought under their control. It is obvious that this ought to be done. The Imperial are subject to all this control, and inspection, and examination; the Chartered also to the same extent as we are, but those other companies are under no such control. We feel that as long as this state of things remains our property is injured by the agitation, and we feel also that amalgamation will not take place while there is only a power to amalgamate with the Chartered Company. If those companies joined the Chartered the public would get 16-candle gas for the present, but next week it may be reversed, and they may only give 14-candle gas, as we do. The illuminating power and price is only fixed for one year, and is then subject to revision. The motives which bring us here to-day are very important, and such as would induce us to carry out the arrangement for amalgamation in good faith. The letter from the Board of Trade in 1871 is one motive, but not the only one, why we have promoted this bill; the views of the Metropolitan Board on the subject is another motive. I cannot give you the precise date when our directors began to determine upon this course; it has been the subject of many discussions from time to time. There is a distinct resolution on their minutes to lodge the bill, which in itself was the subject of long and frequent discussions previously. It is most probable that the board did not approve of the notices being given until November last. If we obtain the bill we should be willing, if desired, to limit our powers of amalgamation to the four companies spoken of on the north side of the Thames. The north side is the most important, it requires a much larger quantity of gas than the south side; it is more subdivided, and more irregular in its arrangements among the several companies than the south, and is obviously the side which wants setting to rights.

Serjeant SARGOOD: Would you be content to take your bill, supposing, instead of putting the four companies in by name, the Independent alone were put in the bill?

Witness: The limitation to amalgamate with the Independent alone would certainly be most objectionable. I do not say we should not amalgamate with the Independent if we had the opportunity, but to limit the bill to that would be useless, inasmuch as it would not bring about the uniformity so much desired.

The CHAIRMAN: Is all this very material, because it seems to protract the inquiry very much?

Serjeant SARGOOD: I think it is material in this way. I am trying to show, by cross-examination, the utter insincerity of this bill, as well as the absence of necessity for it.

The CHAIRMAN: We do not at present see the drift of it.

Cross-examination continued: I remember Mr. Burke, our late governor, being examined before the committee in 1867, and stating, in reply to Mr. Denison: "Neither do I see that we could secure any great economy by amalgamating with any company." And I may add that Mr. Burke is of the same mind now; but I must explain that since that period a new state of things has arisen. The City of London Gas Act, 1868, and the Imperial Company's Act, 1869, have brought about an altered state of things. At that time (1867) there was no supervision of the kind I have referred to; the Metropolitan Board had

no control over us; there was no official audit of the accounts, or anything else and the subsequent views of the Imperial Company have been materially affected by this new state of things. It is not now a question of economy of manufacture or saving of capital (though there is something of that to be done, no doubt), but it is obvious now that the whole of the metropolis, as respects the supply of gas, must be treated with uniformity. Two large companies on the north side of the Thames have for three years been subject to the supervision and control of the Metropolitan Board; four other smaller companies are exempt; and the question is, how can the desired uniformity be brought about? Amalgamation appears to be the only mode of effecting this, and as the Chartered do not seem likely to be able to induce the other companies to join them, the Imperial step in and ask Parliament to give them the power, and they will do their best to carry it out in all sincerity. The benefit of amalgamation with the Independent Company would be beneficial as far as that goes, by putting them under the control of the Metropolitan Board, and so extending the area of the legislation of 1869; but to limit the bill to that appears to me to benefit the metropolis to so small a degree that the bill would be really not worth taking. We have not attempted to treat with the Independent. We have had unofficial communications with the Commercial Company on the subject, also with the London, but not with the Ratcliff Company. I think, if you ask my opinion, that it is fair to come to Parliament and ask for liberty to amalgamate with these companies under the circumstances, because I have at the same time received from the same unofficial sources an intimation that they will never join the Chartered. The course we have adopted on this occasion is precisely that adopted by the Chartered in 1871, when they came to Parliament for general powers to amalgamate with any other company without any previous arrangement as to terms with such company. We have followed that precedent in every respect. Under present legislation none of these companies are bound to amalgamate with the Chartered, nor would they be under this bill. The absorption by the Chartered Company of the Victoria Docks Company was a purchase, not an amalgamation; the others were effected under the Act of 1868, except the Western, which was carried out under the general powers of their Act of 1871. Under the existing state of the law the Imperial Company could join the Chartered if they like. An amalgamation between them is a question of terms and of the relative value of the property of each. The Imperial Company, seeing that an amalgamation between them is about as hopeless a thing as can be conceived, because it would be utter loss to one and gain to the other, see no objection to the provision in this bill inserted at the instance of the Metropolitan Board. The board have a very strong feeling against the existence of one large gas company. I gather from their proceedings that they fear one company would be unmanageable. It was never intended, they say, that there should be one company, and they think if it is done a special Act should be obtained for the purpose.

Serjeant SARGOOD: Then the Metropolitan Board, having sat in judgment upon what Parliament have done, have come to the conclusion that Parliament did not mean to do it, and that they must get an Act of Parliament prohibiting your two companies doing that which Parliament said you might do if you liked?

Witness: They evidently have a strong feeling that upon so large a question, affecting the metropolitan gas supply, it is proper for them to express an opinion, and their decided opinion seems to be that the supply of gas to London should not be in the hands of one company.

Serjeant SARGOOD: You say your bill adopts the legislation of 1868, and yet you put in a proviso at their instigation that destroys the legislation of 1868.

Witness: I do not admit that.

Serjeant SARGOOD: The proviso is, "Provided always that no agreement for the amalgamation of the Imperial Gaslight and Coke Company and The Gaslight and Coke Company, shall be of any force or effect, unless and until it shall have been sanctioned by Parliament." Parliament has already said that, subject to the approval of the Board of Trade, and subject to the hearing of the representatives of the consumers—viz., the Metropolitan Board—the two companies may amalgamate. One of these companies now come and say, "We never will amalgamate with the other company, and it is idle for them to ask us to do so; but we want Parliament to undo the legislation of 1868, and say that we shall not do it unless Parliament gives another sanction."

Mr. RICHARDS: The proviso does not undo the legislation of 1868. All that it says is, that if the amalgamation take place, it must receive the sanction of Parliament, and not that of the Board of Trade.

Sir JOHN DUCKWORTH: That is an interference with the existing law.

Serjeant SARGOOD: You can give no reason for it as far as your company are concerned?

Witness: No; it is the view of the Metropolitan Board of Works that one company is most undesirable.

Serjeant SARGOOD: Then this is a Metropolitan Board bill, and they are ashamed to say so.

By Mr. PHILBRICK: You say that this bill is rather in the interests of the public; but the Chartered supply 16-candle gas at 3s. 9d., and you only 14-candle at 3s. 9d.

Witness: That is the initial price and illuminating power, subject to revision

Mr. PHILBRICK: It is the actual price?

Witness: Untill altered, which may be done year by year.

Mr. PHILBRICK: What advantage do you think the consumers would gain from the amalgamation, with gas at the same price and at a standard of two candles lower?

Witness: They would gain this—the Imperial capital is, one-half of it, subject to a 7 per cent. dividend only. There are many other reasons besides; but they would benefit in that respect.

Mr. PHILBRICK: We thoroughly understand that £1,300,000 of your capital is at 7 per cent.?

Witness: Yes, and we can only get a price upon revision to pay 7 per cent. upon that capital. The Chartered Company have amalgamated with two companies, upon whose capital they have guaranteed 10 per cent., and they have a large amount of 5 per cent. preference capital, convertible at the option of the holders into 10 per cent. ordinary stock. Consequently about £39,000 a year additional profit is required by them beyond that which they now have to enable them to pay this dividend, and the price of gas can be raised for that purpose. Altogether the circumstances of capital are so much in favour of the Imperial, that undoubtedly it would be a boon to the districts to get the Imperial instead of the Chartered.

Re-examined by Mr. RICHARDS: The Chartered Company are now appealing to the Board of Trade Commissioners to raise their price for common gas to 4s. 9d. for the current year. This is not a Metropolitan Board bill; but the Imperial Company in promoting it, carried out what they believed to be the earnest desire of the Metropolitan Board and the Board of Trade. When the bill was deposited, there was nothing in it to prevent the amalgamation of the Imperial Company, with the Chartered, but the Imperial never had the remotest intention of such an amalgamation. They did not think it necessary to prohibit what they did not intend, but for that reason they did not object to the proviso asked for by the Metropolitan Board. If the committee, disapproving of that proviso, struck it out altogether, we should not care, as it is not our own proposal. The same motives do not exist with the Imperial as those which actuated the Chartered Company in desiring amalgamations. In their case there were other companies overflowing with riches, and about to reduce their price. It is not so now. The companies other than the Chartered are perhaps about on an equality. The London and Commercial and our own capital are about on an equality, and I cannot conceive that it would be any disadvantage to either of those companies to be amalgamated with us on equal terms.

Mr. RICHARDS: It is not as it was in the case of the poor Western Company, who brought a dowry to a spendthrift husband, and found it gone before the honeymoon was over?

Witness: No; the circumstances are not the same.

By the COMMITTEE: Our company did not make any effort to buy the Victoria Docks Gas Company. We looked at the works with the view of seeing whether that site would be better for new works than the site at West Ham, but the land to be obtained at that place was very limited in quantity, and wholly insufficient for works of the dimensions we required. It was hemmed in by the docks, and, in fact, only a very few acres of land could be obtained at that spot.

Serjeant SARGOOD addressed the committee, and said he should ask them unhesitatingly, in the interests of justice, to reject the bill. The sole issue they were asked to decide was that "it is expedient the Imperial Company shall be authorized to amalgamate with all or any of the metropolitan gas companies," and, without meaning any disrespect to Mr. Chubb, he might say that the whole evidence which the company condescended to offer in support of their views were the few observations which the committee had heard from their secretary. He (Serjeant Sargood) asked whether, on an important bill of this sort, involving a great public principle, this was what should be expected from a company which, until the Chartered succeeded in carrying out the principles enunciated by Parliament, boasted themselves on being the largest of the metropolitan companies. The promoters called none of their directors, and they gave no reasons for launching this bill. From the beginning of the gas discussion in 1866 to the present time the Imperial Company had stood aloof on this question, holding the authority of Parliament at arm's length—had defied Parliament in terms to pass an Act which should coerce them into doing that which they did not choose to do, and which they said they disapproved of. From first to last they had said: "We disapprove of amalgamation, for as regards ourselves, it would be destructive, and as regards the public, we believe it would be disadvantageous." Did they now come forward as honest converts to a different line of action, intending fairly to carry out what Mr. Cardwell's committee considered to be expedient? Why, Mr. Denison, in his opening speech, said they came forward against their will, and only as a duty, not having in the slightest degree altered their opinion. And yet the object of the bill was amalgamation simply. The company did not come for authority to extend their works; they did not ask for money, nor for greater facilities in the supply of their customers. They had but one idea—amalgamation—telling Parliament at the same time that they did not like it, that it was distasteful to them, and that, in seeking it, they only wanted to discharge a public duty. He (Serjeant Sargood) would tell them that they could as well discharge that duty without the bill as with it. They could go and negotiate with either or all of the four companies to which reference had been made, and when the terms of an union were settled, then would be the time to bring in a bill to give effect to the arrangement.

Mr. RICHARDS: And then be opposed by the Chartered.

Serjeant SARGOOD said he did not see why they should be, but no doubt the public would be entitled to be heard on the subject. All he was now urging for was that if the promoters were honestly desirous to amalgamate with either of these four companies, they could do it as well without this bill as with it. That somebody was behind in the matter was clear; it had crept out, and was apparent from the proviso which had been introduced to prevent an amalgamation with the Chartered Company. The secretary stated that the proviso was introduced to satisfy the Metropolitan Board, but the board were not present to give the reason. They had withdrawn their petition against the bill, so that the committee were left without any pretence for this promise, and no human ingenuity could suggest why the promise was wanted, and why it was put in. If the Metropolitan Board had been present, as they ought to have been on their petition, asking to amend the bill on clauses, there would have been a discussion as to the meaning of this proviso, and why it had been put in.

Mr. RICHARDS: Strike out the proviso, if you like.

Serjeant SARGOOD said it was idle to say that the company were honest in promoting a public principle when they had been uniformly opposing it. Not only was the bill unfairly launched, but it was essentially unfair to the Chartered Company whom he represented, in support of which statement he would call to mind a few of the incidents of the legislation of 1867 and 1868. Referring to the proceedings before the select committee of the House of Commons in the latter year, he said the Imperial Company declined while the Chartered Company accepted the terms dictated by Mr. Cardwell. He did not stay to ask what was the relative amount of pressure in the two cases; nor would he discuss the embarrassed position in which the Chartered Company stood in the City of London with the corporation bill threatening them, and the freedom with which the Imperial Company outside the City acted, knowing as they did that they had nothing of the sort to fear. The Chartered Company accepted the terms, and had carried them out honestly to the best of their power. In doing so they had not been idle, but during the intervening four years had amalgamated five companies. Mr. Cardwell admitted that he was putting up the illuminating power and depressing the price of gas, because he believed the ultimate result of amalgamation would be to enable the companies, with justice to themselves, to serve the public better than they had done. But no one was sanguine enough to believe, not even Mr. Cardwell himself, that the present result of every amalgamation was to be a benefit either to them or to the public. As to his clients, it necessarily involved them for some time in a struggle, but they set to work honestly, as he had said, to carry out the principle in the best way they could. One of their earliest acts was to erect the great works at Beckton, and enter on an enormous scheme of manufacture there. But what would be the consequence if this bill passed to the Chartered Company? Instead of standing as they now did with the advantage of being able to invite other companies to join them in these extensive operations, they would be told, "Parliament has intimated that they do not think you are the right people—by giving them this bill Parliament has intimated that the right people are the Imperial." He would put it as earnestly and respectfully as he could. What had the Chartered Company done that they should be harassed by a piece of legislation like this? He would tell them what they had done as a reason why they should not be so embarrassed. They had expended an enormous amount of money in increasing their works, not only with a view to the existing supply, but to that larger supply which must arise from future amalgamations, and in the session of last year Parliament authorized them to raise an additional £1,000,000, because of the enormous demands that were pressing upon them. It was all very well for Mr. Chubb to say that the committee in 1868 meant that the metropolitan gas supply should be in the hands of four companies, and not one. What was the meaning of this phrase in their report: "But it has appeared to your committee that a strong inference arises from these comparisons in favour of the conclusion that by a judicious amalgamation of these 13 companies into one, or at least into a very reduced number," such and such results would arise? The Chartered Company were ready, and always had been, to go on in the course Mr. Cardwall dictated. If the Imperial Company, with their large district, chose to stand out, they were at liberty to do so, and they were big enough to stand alone. But that was no reason why they should embarrass other companies, and prevent them from joining the Chartered. Nay, more, was it a reason why this committee, upon this meagre and miserable bill, should be asked to allow a new state of amalgamation to be introduced, as though the Chartered Company had been neglecting their duty, with the knowledge that

£4,000,000 of capital in that company were now pledged to the metropolis for the manufacture and distribution of gas, according to the principle laid down in 1868, and accepted by that company? What right had the Imperial to come in and embarrass them? If they wanted to amalgamate, let them do it fairly, honestly, and openly, and having made terms with any of the companies, ask Parliament to sanction the arrangement. But this was an insincere application on their part; they did not want the power for which they asked, and if they obtained it they would not carry it out fairly, because they would do it unwillingly. The Chartered Company had bent themselves to the struggle, they had pledged their capital to it, and he asked the committee, in fairness to those who had done that which Parliament intended, to do them the justice to throw no needless impediments in their onward progress by giving sanction to a bill which was not wanted by its promoters, and which could not be honestly carried out by them.

Mr. PHILBRICK addressed the committee on behalf of the vestries which he represented. He said that on the part of those bodies, as indeed upon the part of the Metropolitan Board, the principle of amalgamation was most distinctly adopted and affirmed; but, as in all other matters, whilst the abstract principle might be right enough, it often happened that the application of the principle, unless carefully guarded, might originate or perpetuate some of the very evils which it was the design of the Legislature in sanctioning the amalgamation of the companies to remove. Unless those amalgamations were effected upon terms which secured to the consumers all the advantages that modern legislation designed they should have, such arrangements would not be within the spirit of the doctrine as laid down by Parliament, nor should they be allowed to be carried out, even though sanctioned by the Board of Trade. It was true that under the existing law every scheme for an amalgamation must receive the approbation of the Board of Trade, and that upon its merits the Metropolitan Board had right to be heard. But the Board of Trade was an administrative and not a legislative body, and, looking to the positions of the companies, must administer the law as it found it. In all the schemes which had been sanctioned, it was provided that as regarded the unraised capital of either of the amalgamating companies, the united company should have power to raise that amount upon the terms of the amalgamating company. So that, though in reference to their new capital the Imperial Company were limited to 7 per cent., if they amalgamated with the Commercial or any other company which had any unraised capital upon which they had power to pay 10 per cent. dividend, they could raise that amount at the higher rate, and expend it in a district where the capital originally sanctioned was subject to the lower rate. He submitted that in this and in other matters the interests of the public required to be watched and guarded. He believed the motive which prompted the company to come to Parliament, and that the power to amalgate which was sought, was less a regard for the public interest than an attempt at rivalry with the Chartered Company in the matter. On the part of the vestries, he protested against the bill, and contended that the company should not be trusted with a general power to amalgamate, unless that power was guarded by restrictions in the interests of the public. The vestries felt that this power would be exercised in competition with the powers vested in the Chartered Company, and that the inevitable effect would be that one or other of these two powerful companies would outbid the other. They would be able to offer rival advantages which would have to be given or conceded at the expense of the public, and therefore, as he submitted, it was right that in each particular case, when an amalgamation was proposed, Parliament should be present to say, "On an investigation of all the circumstances, we will insert clauses for the protection of the public."

The room was then cleared, and, on the parties being again called in,

The CHAIRMAN said: The committee are of opinion that the preamble is not proved.

REFEREES ON PRIVATE BILLS.

MONDAY, MARCH 31.

(*Before Mr.* BONHAM-CARTER, *Chairman; Mr.* ADAIR, *and Sir* JOHN DUCKWORTH.)

PARTICK, HILLHEAD, AND MARYHILL GAS BILL.

This is a bill to incorporate a gas company, and give them powers to supply gas to the burghs of Partick, Hillhead, and Maryhill, together with adjoining districts and places in the parishes of Glasgow Barony, Maryhill, Govan, East and West Kilpatrick, and Renfrew.

The question before the court was as to the *locus standi* of the Corporation of Glasgow and the Board of Police of that city, who had petitioned against the bill.

Mr. CLERK, Q.C., who appeared for the petitioners, stated briefly the objects of the bill, and said the limits of the district to be supplied by the promoters were defined in the 4th section. The petitioners alleged that those portions of the district which were stated in the bill formed almost the whole of Glasgow and its suburbs. Previous to 1869 the city was supplied by two gas companies, but in that year the corporation obtained parliamentary powers to acquire their works. Subsequently the undertakings of the two companies were transferred to the petitioners, and there was not a single place mentioned in the present bill which was not specifically named and described in the bills of the companies whose works and powers the corporation had acquired, with the exception of West Kilpatrick and East Kilpatrick, which might indeed be held to be "places in the vicinity thereof." The barony of Glasgow was the old municipality of Glasgow, and the petitioners had the powers of supplying the whole of the districts with gas, both within the municipality itself, and in every one of the districts proposed to be supplied by this bill, with the exception of the two Kilpatricks, which they were really supplying as "adjacent places." Why, therefore, the *locus standi* of the corporation should be objected to, he (the learned counsel) could not say. The parties promoting the bill had formed themselves into a limited company, and in that capacity they had no power to break up the streets. To their making gas and supplying themselves the petitioners would not object, but they did object to the promoters seeking parliamentary powers to compete with the corporation. The other petitioners were the Police Board, who objected that there ought not to be another body having power to break up streets and interfere with the sewers. The promoters alleged that the petitioners had no jurisdiction beyond the limits of the municipality; but the fact was that they were in possession of the whole of the district by parliamentary authority, and the promoters started a new scheme to compete with them.

Mr. LITTLER, Q.C., objected to the *locus standi* of the petitioners, as the city of Glasgow was not included in the scheme at all. He quoted the preamble of the bill to show the intentions of the promoters, which were to supply a portion of the barony of Glasgow on the other side of the Clyde from that supplied by the petitioners, and the Police Board had nothing to do with that district. The other portions mentioned were all beyond the municipality; and the learned counsel, while conceding that other words might have made more plain the intentions of the promoters, urged that if there had been any intention to supply Glasgow itself, the limitation section of the bill would have set forth the intention to supply the city of Glasgow, and the burghs of Partick, Hillhead, and Maryhill, &c. As it was, the words could not be twisted to imply that the city was meant to be supplied. They could not be held to signify that the city of Glasgow was a district or place within the barony so as to be *ejusdem generis* with Partick and the other places mentioned. The population of the three places mentioned in the title of the bill was only 18,000, while that of the city of Glasgow was 300,000. It could not, therefore, be said that Glasgow was to be classed with the "adjacent places" to Partick. If they meant to say that the city of Glasgow was to be included in this scheme, they might just as well say that London was included in the town of Brentford. With regard to the question of the petitioners *locus* to oppose this bill as a rival company's, they should not be let in on the ground of competition, unless the referees thought the interests of the corporation were about to be affected by this bill. The question was whether persons not having a monopoly by articles of association could have a *locus standi* against an improving competition.

The referees allowed the *locus standi* of both petitioners.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

Dr. Stevenson's report on the quality of the gas supplied to St. Pancras during the month of March, states that the average illuminating power of the gas supplied by the Imperial Company was 15·3 standard sperm candles, the highest illuminating power 16·3, and the minimum 14·3 candles. The illuminating power was about a quarter of a candle below the illuminating power observed during the preceding month. Of impurities, ammonia was always present in small quantities, whilst sulphuretted hydrogen was never detected. Sulphur in all forms was present to the extent of 25·54 grains per 100 cubic feet.

METROPOLIS WATER SUPPLY.

Dr. Frankland, F.R.S., in his report for the month of March, states that the amelioration in the condition of the Thames noticed in the previous month has not been maintained. "The Chelsea, West Middlesex, and Southwark Companies succeeded in efficiently filtering the muddy water, but the Grand Junction and Lambeth Companies delivered slightly turbid water, which contained moving organisms. The water of the Lea, supplied by the New River and East London Companies, was of better quality, and was efficiently filtered before delivery." The water supplied by the Kent Company from deep wells was bright and transparent, and fully maintained its usual high degree of purity in respect of organic contamination. Taking the quantity of organic impurity in the Kent Company's water as unity, the proportional amount in an equal volume of water supplied by each of the other metropolitan companies was:—East London 5·1, New River 5·4, West Middlesex 7·4, Chelsea 8·1, Southwark 8·2, Grand Junction 8·5, and Lambeth 8·9.

ACCIDENT AT THE ROME GAS-WORKS.—The roof of the gas-works at Rome was struck by lightning on Thursday last, and fell in consequence, burying 40 workmen in the *débris*. Five of the men were killed, and 17 others badly hurt. The injured were taken to the hospital.

A DRUNKEN ENGINE-DRIVER.—An engine-driver at the Beckton Gas-Works was charged on Tuesday, at the Woolwich Police Court, with being drunk whilst in his employment in charge of a steam-engine. The magistrate was in doubt whether the man had been intoxicated on a "highway or other public place," as is required by the Act to constitute an offence, and discharged the prisoner.

GREAT PUMP.—The *New York Bulletin* states that in an Albany shipyard there is now in process of construction a tugboat designed for towing and wrecking purposes, both inland and at sea, and that it will be provided with a centrifugal steam wrecking pump, of 18 inches suction, and same discharge, worked by a powerful separate engine. This pump will have a capacity of raising and discharging water at the rate of 15,000 gallons per minute. 900,000 gallons per hour, or 9 million gallons per working day of ten hours. This is said to be one of the largest capacity in these parts, if not in the country.

GAS STOKERS STRIKE IN NEW YORK.—Telegrams from New York state that the city has been suffering from a strike of stokers. The papers just received by mail state that on March 27 the gasmen were meditating a strike. A stoker, writing to the *World*, gives the workmen's account of the dispute. He says that the rate of wages that have been paid for a number of years is 3 dols. 25 cents to firemen, and 2 dols. 50 cents. to helpers per day. With the wages the men found no fault. Last June, when they made a demand for eight hours, the employers offered 1 dol. per day extra for twelve hours, but it was less time and not increase of pay the men wanted. They obtained the eight hours, but a few weeks ago were compelled to fall back to the old system of twelve. It was stated that the companies were determined not to go back to the eight hour system, and hence the strike which commenced on Sunday week. A later telegram states that the strike is an entire failure.

DEWSBURY AND BATLEY GAS-WORKS.—The bill promoted by the gas company, which, on application, was adjourned in consequence of the probability of an arrangement being made with the opponents of the measure, came before the select committee of the House of Commons on Tuesday, April 1. On the bill being called over, it was announced that all opposition had been withdrawn, and it was, therefore, ordered to be reported to the House to be referred back to the Committee on Unopposed Bills. At a meeting of the Dewsbury Town Council on the same day, the borough seal was affixed to an agreement for the purchase of the company's works for £266,875. The half-yearly meeting of the shareholders was held on Thursday, April 4. Dividends at the rate of 10 per cent. on the A and D shares, and 7½ per cent. on the B and C shares were declared, and £660 carried to the reserve-fund.

DUMBARTON GAS COMPANY.—SALE OF THE UNDERTAKING TO THE TOWN COUNCIL.—At the meeting of the Town Council, on the 1st inst., Provost Bennett reported that the negotiations with the gas company for the transfer of their works to the town, as proposed by the bill promoted by the council in Parliament, had resulted in the directors offering to accept perpetual annuities at the rate of 9 per cent. per annum for the capital stock of £6000, the council not to have the right to compel the sale of stock to the town at less than 25 years purchase, and to take the stock of coal and the tools at a valuation. This offer being nearly the same as made by the Property Committee on behalf of the council, and on the whole fair and reasonable, he moved should be accepted. Bailie Thomson seconded the motion, which was agreed to.

ANOTHER FATAL GAS ACCIDENT AT DUNDEE.—On Friday, April 4, a woman named M'Nab, the wife of a seaman, residing in Charles Street, Wellgate, was discovered by her husband, on his return from his vessel, in a state of stupor, owing, it is believed, to an escape of gas into the premises. The house had been closed for two or three days without exciting the alarm of the neighbours, who supposed that she had gone on a visit to her mother at Forfar. Her husband on his return obtained access to the house by forcing a window, when he found his wife lying in bed. She appeared sound asleep, and although he was somewhat concerned to see several scratches on her face, and her hair greatly dishevelled, he was not disposed to disturb her, thinking he would receive a satisfactory explanation when she awoke. He allowed her to remain in this state till Saturday morning, when medical assistance was called in, but though every effort was made to restore animation, the poor woman subsequently died. The smell of gas was apparent on the premises. M'Nab did not use gas, but the dwelling was fitted up with piping. On putting a lighted paper to a part of the pipes inside the house, a great flame was immediately created; and, on a more minute inspection, all the lock-fast places were discovered to be much permeated by gas.

M'ILHENNY'S VACUUM PROCESS.

FIG. 1.

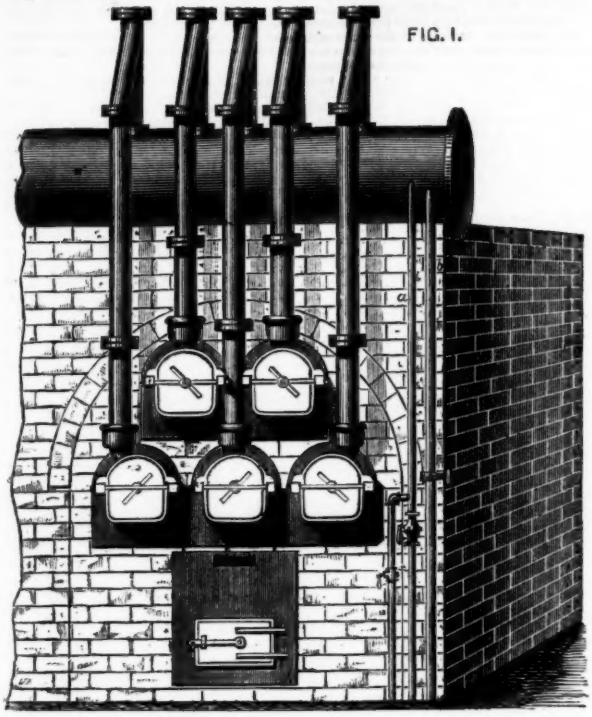
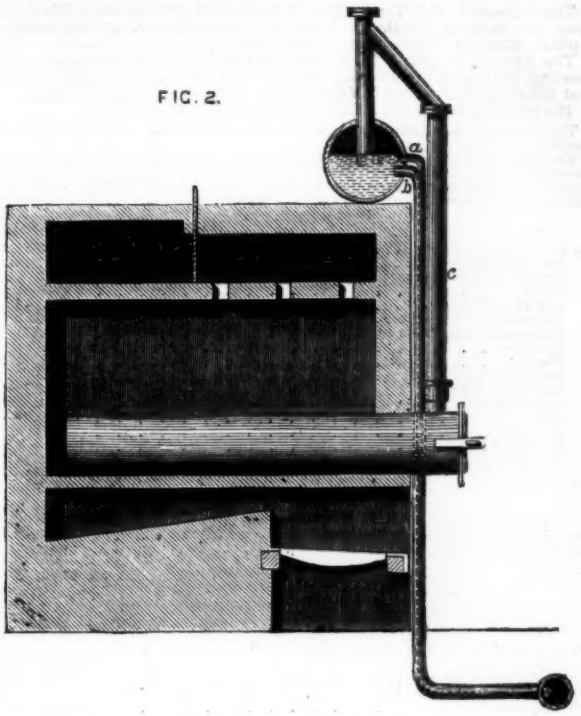
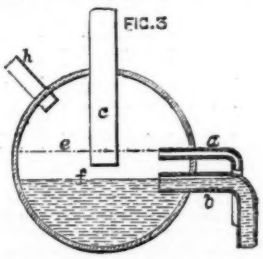


FIG. 2.



The object of this invention is to prevent the formation of carbon in the retorts by relieving them from the pressure caused by the sealing of the mouths of the dip-pipes in the hydraulic main. The inventor is Mr. Geo. A. M'Ilhenny, engineer of the Washington, U.S.A., Gas Company, and the means which he here adopts to accomplish his purpose are extremely simple and effective. The retorts are arranged in the usual manner, and have the ordinary connexions with the hydraulic main. This latter, however, is divided into compartments by bridges at the height of the overflow-pipe, and three-quarters of an inch above the mouths of the dip-pipes, each compartment receiving the pipes from one

FIG. 3



bench of retorts. Each compartment is provided with a tar-pipe, *b*, below the level of the seal, and a water-pipe, *a*, above the level of the dip. These pipes are each provided with a cock or valve, so that either may be closed or opened at will. By opening the valve in pipe *b*, and permitting the tar or tar and water to flow through it, the contents of the main can be reduced to the level of the line, *f*, thereby unsealing the mouths of the dip-pipes, and of course permitting the gas to flow from the retorts into the main as fast as it is formed, thus relieving the retorts of the pressure which usually exists in them, and thereby preventing the formation and deposit of carbon therein. When the retorts are in operation, the tar is allowed to pass off through the lower pipe, *b*, but when it is desired to open the retorts for any purpose, the cock in pipe *b* is closed, and that in pipe *a* is opened. The contents of the main are thus raised to a level with the pipe *a*, thus sealing or closing the mouths of the dip-pipes, and preventing the back flow or escape of any gas from the main. The inventor says: "The means I adopt are so simple and effective, that no more than the ordinary skill of a stoker is required to work the benches, as it only involves the turning of two cocks at each charge. And should any benches get out of repair, all that is necessary is to leave on the seal. You will perceive that one or all the benches can be worked with or without the seal, at pleasure. There is nothing to get out of order, and 15 dols. to a bench will attach it to any works, old or new; nor does it in any way alter, change, or interfere with the arrangement of the works, as before constructed." The benefits which he claims as the result of his process are—1. Greatly decreasing the deposit of carbon in the retorts. 2. Increasing the heats, and ensuring more uniformity. 3. Giving the retorts full capacity. 4. Very much increasing the yield from the coal. 5. Reducing the number of retorts required; and all the incidental results that will follow."

Mr. Yorke, the engineer of the Portland, Maine, Gas Company, writes us that the process has been in operation at his works upwards of three years most satisfactorily. It is also in use at the Washington D.C. and other works, and Professor Wurtz, who visited the Portland works in November last, gives the following as the result of his investigation of the quality of the gas there manufactured:—"The photometric observations were made at intervals during two days, Nov. 12 and 13, the results being very uniform, and the mean of the whole, reduced to 120 grains sperm per hour, was 17·46 candles. The burner, the only Argand we had, was by no means favourable to the gas, being adapted for 14-candle gas, and this gas when burning 5 feet frequently tailed up above the chimney. The candles were weighed delicately, and the rate of sperm consumption determined by burning a whole hour at a time. During the two days the gas made was 358,000 feet, and the coal used 73,200 lbs., of a mixture of half Youghiogheny and half Despard, with 4½ per cent. of Grahamite ("Ritchie"). This is equal to 4·89 feet of gas per lb. of coal, and if calculated to the "standard volume" of 9500 feet of gas per long ton, is equivalent to 20·13 candle gas. It is proper to add that the Despard was of last year's stock (though under cover), and had of course deteriorated somewhat."

PURCHASE OF THE DUBLIN ALLIANCE GAS-WORKS.—A GENUINE IRISH PROCEEDING.—In December last the Dublin Chamber of Commerce, on the express invitation of the corporation, appointed some members of their body to serve on the Gas Committee during the deliberations on the propriety of purchasing the gas-works. These gentlemen have taken an active part at all subsequent meetings, and the corporation have uniformly acted upon the advice tendered by the committee of which they were *de facto* members. It seems, however, that the Irish blood of some members of the council has been roused at the irregularity of the proceedings, and, on a requisition to the Lord Mayor, a corporate meeting was convened on the 24th ult., to consider the following motion—"That the resolution of the council, whereby five members of the Chamber of Commerce (not being members of the council) were placed on the Gas Committee, be rescinded." The proposer (the Hon. W. Vereker), waxed eloquent on the question, which, he said, involved "the honour, the integrity, and the dignity of the corporation," and declared "that there was no Irishman who did not look with pride and pleasure to that period of Irish history not long past, when the Irish House of Commons declared, under the advice of Grattan, that there was no power under heaven of binding the Irish people except the laws made by the King, Lords, and Commons of Ireland." The introduction of irresponsible advisers on the subject of the gas-works purchase, he averred, would be an argument against Irishmen having the control of their own affairs, and "a Parliament on College Green," because by it they proclaimed "that there was no use in popular representation, that they were unfit to manage their own business, that they were in danger of betraying the trust reposed in them, and he hoped the vote that day would show that the members of the house felt they were neither incapable nor unworthy of discharging the duties committed to their care." Against such an appeal what could be urged? It was vain to suggest that the step proposed to be taken was somewhat late, and that Mr. Vereker and those who felt with him had been somewhat tardy in vindicating the corporate honour, and that they ought to have met the proposed invitation with on indignant negative three months ago; and it would have been equally vain to suggest that the passing of such a resolution would indicate a lamentable want of that politeness to which Irishmen lay so strong a claim. Mr. Byrne, it is true, reminded Mr. Vereker, that in December last, when, for the first time, it was mooted that the assistance of the Chamber of Commerce should be asked to investigate the gas project he with other members maintained there was not sufficient ability in the house to thresh the subject. The council were now asked to stultify themselves by breaking their engagement with the gentlemen who gave assistance when invited. The oratory on the other side was overwhelming. Mr. Gunn suggested that it might be said the consumers of gas were fully entitled to be represented on the committee. He confessed he could not agree in that view. The consumer was to get so many thousand feet of gas at a certain price and of a certain quality, and when he had secured that he had no further rights in relation to the council. And then came Mr. Dennehy, who loudly protested that by inviting the co-operation and counsel of the Chamber of Commerce the Corporation of Dublin were asked to stultify themselves, and undo and annihilate what it had taken O'Connell and the men who stood behind him 25 years to accomplish. As one of the men who stood behind O'Connell in his movements for Catholic Emancipation, for Parliamentary Reform, and Municipal Reform, he protested against the act of bringing in these outsiders into the corporation. It was a base betrayal of the trust confided in them. They had no more power to admit outsiders than the Irish Parliament had to annihilate themselves. It is not to be wondered at that after such appeals the corporation, by a considerable majority were prepared to ignore their former act, and to dismiss the gentlemen of whose services they gladly availed themselves, until the purchase question was practically decided, without even the scant courtesy of a formal vote of thanks. A special general meeting of the Chamber of Commerce was held on the 2nd inst., when their representatives at the Gas Committee reported the retrocession of the corporation on this and other points at which an agreement had been arrived, whereupon it was resolved to oppose the bill in Parliament. A meeting of the corporation was called for Saturday last to consider a motion by Mr. Dennehy to retreat from the bargain with the gas company altogether, and to withdraw the bill now before Parliament, the committee on which bill is fixed for the 24th inst.

PHŒNIX GASLIGHT AND COKE COMPANY.

The Adjourned Half-Yearly General Meeting of Proprietors of this Company was held at the Bridge House Hotel, Southwark, on Wednesday, April 9—EDWARD HORNER, Esq., in the chair.

The SECRETARY (Mr. I. A. Crookenden) read the notice convening the meeting, the seal of the company was affixed to the register of proprietors, and the minutes of the last half-yearly and *pro formâ* meetings were read.

The following report and statements of account were presented :—

The directors herewith submit trade account and balance-sheet to the 31st of December last.

They report that the past half year has been a period of much anxiety, caused by the advance in the cost of materials and the very unsettled condition of labour, and they regret that the enormous increase in the value of coals will shortly render a material addition to the price of gas unavoidable.

In December last nearly the whole of the men employed in the retort-house at Greenwich, and also a few men in the retort-house at Bankside, struck without giving any notice; but, by the energetic management of the engineers, the supply of gas was so well maintained that very little inconvenience was felt by the consumers.

The progressive increase in the consumption of gas rendering it necessary to provide more storeage room, contracts have been made for the construction of two tanks and one gasholder, and also for an extension of mains.

Consequent upon this increase of the plant, a call of 10 per cent. will have to be made upon the 7½ per cent. stock, payable in the autumn, of which due notice will be given.

The net amount of profit for the past half year is £43,936 18s. 11d., which, added to the unappropriated balance of £27,311 3s. 1d. (after paying dividends in October last), makes a total of £71,248 2s. to the credit of profit and loss as per that account, out of which your directors recommend that dividends be declared as follows, viz.:—On the £20 divided shares, 10 per cent. per annum; on the new stock, 7½ per cent. per annum; on the capitalized stock, 5 per cent. per annum, less income-tax, leaving an unappropriated balance of £34,573 2s.

Abstract of the Trade Account, Half Year to Dec. 31, 1872.

Dr.				*Cr.*			
To Coals used	£58,919	11	11	By Rental	£112,373	13	7
Materials supplied	14,611	14	0	Coke	33,785	19	3
Meters—repairs and renewals	2,010	6	8	Breeze	630	14	6
Rates	3,739	19	8	Tar	2,818	2	8
Law charges	32	13	4	Ammonia	2,181	15	4
Directors, £1000; auditors, £50	1,050	0	0	Rents	1,634	8	0
Salaries and commission on collection	5,482	11	1	Miscellaneous receipts	658	15	11
Pensions	682	4	5	Interest	194	18	5
Wages	19,552	5	10				
Bad debts and allowances	145	2	3				
Interest on bonds	2,920	12	11				
Leasehold-fund	430	0	0				
Rents	486	14	0				
Interest	122	4	2				
Insurance	155	8	6				
Net profit	43,936	18	11				
	£154,278	7	8		£154,278	7	8

Profit and Loss.

Sept., 1872.—To dividend for half year ended June 30, 1872	£36,675	0	0	July, 1872.—By balance brought forward	£63,986	3	1
Dec. 31, 1872.—To balance carried forward	71,248	2	0	Dec. 31, 1872.—By half year's profit	43,936	18	11
	£107,923	2	0		£107,923	2	0
				Jan. 1, 1873.—Balance brought down	£71,248	2	0

Abstract of the Balance-Sheet, Dec. 31, 1872.

Dr.				*Cr.*			
To Capital of 27,000 £20 shares, paid in full (maximum dividend 10 per cent.)	£540,000	0	0	By amount of plant on June 30 last	£905,008	17	7
Capitalized stock, paid in full (maximum dividend 5 per cent.)	144,000	0	0	Expended this half year for extension of works	4,556	12	1
New stock, £360,000, £45 per cent. paid up (maximum dividend 7½ per cent.)	162,000	0	0		£909,565	9	8
Bonds, at 5 per cent.	125,000	0	0	Investment of leasehold-fund	17,697	14	4
Unpaid dividends	119	4	3	Reserve-fund			
Unpaid tradesmen's bills, &c.	20,762	10	3	Invested £11,190 6 8			
Leasehold-fund	17,697	14	4	In hand for investment (being half year's dividend thereon) 239 10 3	11,429	16	11
Reserve-fund	11,429	16	11	Amount due for rental—			
Balance of profit and loss—				Christmas quarter £74,242 18 1			
Unappropriated balance £27,311 3 1				Arrears 252 5 9	74,495	3	10
Half year's profit 43,936 18 11	71,248	2	0	Amount due for coke and breeze £14,662 9 1			
				Ditto tar 841 2 5			
				Ditto ammonia 1,646 7 9			
				Ditto sundries 2,170 2 4	19,320	1	7
				Stock of coals £8,702 11 3			
				Ditto coke 1,518 8 0			
				Ditto breeze 26 5 0			
				Ditto tar 461 0 9			
				Ditto ammonia 250 10 0			
				Ditto retorts 1,118 0 0			
				Ditto pipes 1,214 16 3	13,291	11	3
				Meters	41,102	14	11
				Balance at treasurer's	5,354	15	3
	£1,092,257	7	9		£1,092,257	7	9

The CHAIRMAN : Gentlemen, I rise to move—"That the report and accounts be received and entered on the minutes." In doing so it is scarcely necessary for me to say that I believe in the history of gas companies there never was a period of so much anxiety as during the last six months. Everybody knows—it is patent to us all—the strike which took place pretty generally—almost without exception—throughout the works of the metropolitan gas companies. Fortunately for us, owing to the excellent conduct of our officers, the strike at our works was not general, only partial, and it was so energetically met by the officers in whose district it occurred that very little inconvenience was suffered by the public; in fact, so little did we ourselves feel the inconvenience, that we were able to afford some small assistance to other companies more pressed than ourselves. During the whole six months there was a constant agitation going on amongst the labouring part of our establishment for an increase of wages, and one of the companies in the metropolis having given way on this point, there was nothing but for the others to do the same thing. We did so, and we hoped that we had fully satisfied our men. But I believe the real fact was they struck for a sentiment. One of their own body being, as they thought, improperly dismissed from another company, and his reinstatement refused, they felt themselves aggrieved. I believe there was no other cause, and that the wages and the work in our establishment they were perfectly satisfied with. Probably the result of the strike may be beneficial to us, inasmuch as it shows to the men that, notwithstanding the inconvenience that they caused by such a proceeding, still we are able to get labour which will supply the temporary inconvenience, and the works will not be stopped by the men striking. I think that will be the effect, and in all probability it will be a considerable time before we are again inconvenienced by such a proceeding, so that perhaps out of evil good may come. Then I think we should not miss this opportunity, not only to thank our officers for what they did on that occasion, but tender our thanks also to Messrs. Aird and Sons, the contractors, who have done more for this company than for anybody else. On that occasion, at Greenwich, they supplied a number of efficient men, and assisted the engineer, and enabled him to carry out the work, and prevented the inconvenience of a strike which was pretty nearly general, as there, excepting a few old hands, every one left his work. It is only due, therefore, to those gentlemen that we should state publicly the assistance they rendered us on that occasion. From that I pass to the suggestion made in the report that we require more room for the storeage of gas; and I may tell you that the last gasholder was constructed in 1869. The consumption of coals in the London district alone has increased from 1869 by upwards of 13,000 tons, and therefore you may imagine with such an increase as that there is an absolute necessity of having plenty of storage room. We should not ask for it did we not find it necessary, knowing that the most economical method of working is by having plenty of storage room. Another reason for that necessity is that the Sunday work is now very much diminished. No work is done in the manufacture of gas on Sundays between six o'clock in the morning and six o'clock in the evening, and the consequence is that losing a fourteenth part of the week a greater amount of space is necessary for the storeage of gas than we had before. Of course, this is an expense to the company, but, at the same time, I think every one must be of one opinion, that Sunday labour should be avoided as much as possible. If you go abroad—take France for instance—you will observe the lassitude with which the labouring community do their work generally, and that, no doubt, arises from the fact that the men are employed the whole seven days of the week, so that they are never fresh. An English workman going to France at twice the wages paid to native workmen is worth a great deal more working six days a week only. Necessarily, as I said, the cost to the company is greater, but knowing the additional vigour and energy which is thrown into our service by the arrangement, I do not think it is altogether a loss to us. I probably shall be asked when we are likely to call for more money, and I may say we have contracted for two tanks, a gasholder, and additional pipes, which will consume upwards of £30,000; the call will come to £36,000, but we do not anticipate that we shall want the money till November, which is the usual time we have made the calls. You will have observed of late there have been a great many new schemes in the way of gas manufacture, but it has been shown that they are all *réchauffé*—all old schemes dished up under new titles, and will be proved to be of no value at all. All we can say is, if any better method of making gas can be invented than that which we adopt, we are not so bigoted as to set our faces against it, but shall be very glad to find a way of supplying the public at a less price, knowing that it will produce more satisfaction to the public and be no injury to ourselves. I will now refer to the accounts, which I think, looking at the extraordinary fluctuations which there have been in the price of coals during the last half year, are not altogether unsatisfactory. You will find that we have paid this half year the most extraordinary sum of £13,400 more for our coals than we paid in the corresponding half year of 1871. That has been caused in some measure by the increased quantity required, because, although we had some favourable contracts, they were only for a certain quantity, and the rest had to be bought, and that has raised the average price to 17s. 6d. against 15s. 2d. I only wish we could provide the coals for the future at the same moderate rate. I am afraid the time must come when we shall have to pay the dreadful prices which others are paying now. We have been obliged to make some contracts for coals, because we felt in a company like this we ought not to run the risk of getting a supply, and we have made some contracts at present market prices. Our present contracts terminate on the 1st of August, and, finding all other companies did the same, we were rather afraid we should be left in the cold if we did not do so. The total increase in the expenses of the establishment has arisen from the increase in the cost of coal and labour, for in almost every other item we have diminished our expenses. This is a very gratifying circumstance, and shows that our officers have carefully attended to the interests of the company. On the other side of the account you will see we have obtained some compensation for the enormous increase in the price of coal, inasmuch as we have realized £13,500 more for our coke than in the corresponding period of last year, being of itself a shade more than the increased price we paid for the coals, so that at present we have sustained but little damage from the extraordinary state of the coal market. Many proprietors will perhaps be rather surprised when I tell them that the price of coals, free on board, in the north is now more than three times the price at which we made our previous

contracts. The demand, therefore, of a company on the other side of the water for an increased price of gas is very fair, for it is unreasonable to suppose that a manufactured article can be supplied at the same price when the cost of the raw material from which it is derived has advanced threefold. The only wonder to me is, how the metropolitan companies have gone on as they have done. Having made these remarks, I have nothing further to say than this, that the company are most anxious not to make any advance in the price of gas, if it can by any possibility be avoided. Of course, we have our duty to our shareholders, and we have our duty to the public, and probably we will be willing to suffer a good deal; but still it cannot be supposed any concern should supply a great want of the public without receiving a proper remuneration for it. We have, in our report, stated we believe a rise in the price must be inevitable. We feel, to a certain extent, it is so; but still we shall hang on as long as ever we can without making any change. If these prices continue, we cannot help ourselves, and we shall guard your interests by raising the price. Under present circumstances, however, we have no immediate intention of taking that step. With these few remarks, I now move the adoption of the report.

Dr. PUCKLE seconded the motion, and said, in common with all the proprietors, he had looked forward with much interest to the results upon the company's accounts of the strike which took place at their eastern station. It was very gratifying to find that the additional expense to which the company had been put was not greater than it appeared to be. After all that had been done for the working men, it seemed an extraordinary thing that any strike at all should have taken place. The advance in the rental of the company was not so much as might have been expected—only £3000—but there was one satisfactory thing in connexion with it—viz., that the profit of the half year was £5000 in excess of the corresponding period of the previous year. He confessed that he was not prepared for so favourable a statement as that, and had, in fact, expected that it would be necessary to draw upon the undivided balance to make up the dividend on this occasion. Fortunately, this was not the case, owing to the advantageous sales of coke. There were two items in the accounts to which he would call attention, as he thought the directors did not get so much as they ought to do from those sources—viz., the tar and the ammonia. Probably the cause was explainable. It might be that the existing contracts for the sale of these residuals were made before the rise in the markets, or that, as regards the latter, it was produced of a weak quality. He was glad to see the paragraph in the report referring to the intention of the directors to increase the price of gas. He quite agreed in the remark made by the chairman that it was desirable if possible to avoid an advance, at the same time it was well to bear in mind that the public were prepared for it now, seeing the high price of coal, whereas they might not be so prepared hereafter, when the necessities of the company would be greater. When the directors had to take new contracts at three times the price they paid under the old contracts it was clear the balance would be considerably against them, and though it was very gratifying to see that the company had an established reserve-fund, and an undivided balance of profit, which was greater now than before, he felt sure that the increased cost of coal would so affect the trade account that they might find themselves in great difficulties if the directors delayed too long an advance in the price of gas. It was a matter the necessity for which the public could appreciate at the present time, seeing that this company and one or two others were the only ones in the metropolis who had not resorted to that step.

Mr. HOBSON said he could not help congratulating the directors and shareholders generally on the result of the balance-sheet. He could assure the board that gas companies in the provinces watched the progress of the recent strike in the metropolis with great interest and sympathy. They felt that the directors here were fighting their battles, and the result of the struggle was to them very satisfactory. He only hoped a similar disturbance of the companies operations would not occur again. He concurred in the remarks made by the chairman as to the advantage of possessing more gasholder room. It was not only extremely useful in a general point of view, but it gave the company a more efficient control over their men, by making them to a certain extent independent of them. The directors were therefore acting wisely in making further provision in this direction. As to the increased price of gas, he was glad to hear the remarks made in reference to it, and was satisfied that the advance should be obtained before a reduction took place in coal, otherwise it might happen that in a year or two the company would find themselves paying a much higher price for coals than they now paid under existing contracts, while the reduction from the present prices would make the public less willing than they now were to concur in the necessary advance. This company were not tied down to a low maximum of price, so that the directors could do justice to the shareholders. Reference had been made to so-called new schemes and new inventions. All he could say was that, as far as he knew, the engineers only smiled at them, but, as the chairman remarked, if it should turn out there was anything in them, the company could purchase the right to use them in their district. It must be something very curious that was not carried through pipes, and this company having possession of mains all over the district, were in a position to take advantage of any new method of supply when its value was practically determined. The shareholders, therefore, need feel no alarm at these discoveries.

The CHAIRMAN, replying to Dr. Puckle, said the comparatively low return for residuals arose exactly in the way suggested. The contracts for the sale of them for fixed periods were made previous to the advance in price. Every one acquainted with gas manufacture knew that until the last year or two tar and ammonia were a positive burden to the companies in the metropolis, and the directors were obliged to make the best terms they could to get rid of them. Fortunately this company, to a certain extent, had saved themselves, because in their contract there was a provision, that as ammonia rose in value in the market, they should receive some compensation for it, though as it turned out, not so much as they should have done. Referring to the remark made by Mr. Hobson, he might state that the value of abundant storeage room had been proved during the recent strike. At Greenwich, the engineer managed to keep the men at work during the Sunday preceding, and so filled his gasholders which enabled him to get some breathing time on the Monday while he obtained some fresh men, and kept the district supplied. The inconvenience to the public was very much reduced by the fact that the company had good storeage there for gas. With regard to coals and the future price of gas, he quite agreed in the observation that it would be an awkward thing to raise the price of gas at the time when coals began to fall. He believed the consumers throughout the whole of the districts were quite prepared for a rise, still the directors would do all they possibly could to benefit the public by keeping down the price, and would only make an advance when they were driven to it by absolute necessity.

The motion for the adoption of the report was then put and carried.

Mr. *Shand* (deputy-chairman), moved—"That dividends for the half year ending Dec. 31 last be, and the same are hereby declared and made out of the profits of the undertaking, at the following rates:—On the original shares, at the rate of 10 per cent. per annum; on the capitalized stock, at the rate of 5 per cent. per annum.; and on the amount paid up on the new stock, at the rate of £7 10s. per cent. per annum less income-tax in each case, such dividends to be payable to the bankers of the proprietors so ordering it, and the remaining dividends to be forwarded by post."

Mr. HARRIS seconded the motion, which was put and carried.

The chairman having vacated his seat, Mr. HOBSON was called upon to preside, and on a motion by him, seconded by Mr. W. B. JAMES, the retiring directors and auditors were re-elected, Mr. Horner being again appointed chairman and Mr. Shand deputy-chairman of the company. A cordial vote of thanks was also given to the board for their careful management of the company's business during the last half year.

Mr. HORNER having again taken the chair, acknowledged his obligations to the shareholders for re-electing him, and on behalf of the directors generally expressed thanks for the vote just passed. He said the board had passed through a very trying period, but they had endeavoured to do their best to preserve the interests of the company. The confidence once more reposed in them would not be misplaced, and notwithstanding the extraordinary circumstance connected with gas manufacture, over which, of course, they could exercise no control, he hoped the directors would be able to meet the proprietors at their next meeting with as satisfactory a statement of affairs as they had that day been able to present.

Mr. HOBSON thought the shareholders ought not to separate without expressing to the secretary, engineer, and other officers of the company, the sense they entertained of the ability with which they had conducted the business during the trying events of the last six months; he, therefore, proposed a vote of thanks to these gentlemen, and also to Messrs. Aird and Sons, for the ready and effectual help they rendered the company during the strike.

A SHAREHOLDER seconded the motion, which was very heartily responded to.

The SECRETARY: Gentlemen, I beg to return you our most sincere thanks for this mark of your approval and goodwill towards us. The past few months have, no doubt, been very trying times to all of the officers of the company; but we did not look with alarm upon the state of affairs. We have endeavoured to do our duty in the past, and we shall not shut our eyes in the future to what has gone before. I trust we shall continue to merit your confidence.

The proceedings then terminated.

BRISTOL WATER-WORKS COMPANY.

The Twenty-Seventh Annual General Meeting of this Company was held on Saturday, March 29—HENRY ABBOT, Esq., in the chair.

The SECRETARY (Mr. A. J. Alexander) submitted the report of the directors, which stated that the revenue from water-rates for the year 1872 was £45,121 1s. 1d., being an increase of £1392 5s. 11d. over that of the previous year. The sum shown by the revenue account to be applicable for dividend was £10,482 2s. 5d., and the directors recommended that a dividend of 26s. per share be declared, which, with the intermediate payment already made of 24s., would make the dividend for the year 50s. per share. Judging from the accounts alone, there would appear to be a falling off in the rate of increase of the revenue; but this was not, in fact, the case. During 1871, owing to the water having been let off for a considerable time from the floating harbour, there was a large exceptional demand for manufacturing and other purposes, and the revenue for that year was, from this casual source, benefited to the extent of £700 or £800. During the past year the ordinary trade of the company had not only overtaken this accidental receipt, but a further increase, to the extent above mentioned, had been permanently established. The directors, in compliance with many pressing applications, had, during the past year, laid mains for the supply of water to Westbury and to a district at Horfield, where building to a considerable extent was being carried on, and had thus secured the means also of affording a supply to the Horfield barracks, the arrangements for which would be carried out as soon as a vote for the purpose was sanctioned by Parliament. The capital expended during the past year was £9459 19s. 7d., and the length of mains laid was about 7¾ miles. The engineer reported that the works are in good condition.

The CHAIRMAN, in moving the adoption of the report, said it was with great pleasure that, on that their 27th annual meeting, they were able to declare a 10 per cent. dividend for the year. During that long period the dividend paid to the shareholders had scarcely exceeded on the average 2 per cent. They had long looked forward to the time when they would be able to pay a 10 per cent. dividend—at times they had more hope than at others, but they had always faith that the company would be eventually in a good position. He was happy to say that the position of the company was not only good at the present time, but that it was likely to be permanently good. Having drawn the attention of the shareholders to the very satisfactory state of the accounts, and pointed out that the liabilities of the company were exceedingly small, he concluded by moving the adoption of the report.

Mr. FRANCIS FRY (deputy-chairman) seconded the motion, which was adopted.

On the motion of the CHAIRMAN, it was resolved that a dividend of 26s. per share on the original shares be paid on the 15th of April next.

The retiring directors and auditor having been re-elected,

The Rev. T. MAYNARD moved a vote of thanks to the directors for their services during the past year, and said he had no hesitation in saying the directors were worthy of the thanks of the shareholders.

Mr. BALE seconded the resolution, and it was unanimously agreed to.

The CHAIRMAN having briefly acknowledged the compliment, a vote of thanks was, on the proposition of Mr. HOLMES, seconded by Mr. MORCOM, accorded to the auditors, and the usual compliment to the chairman brought the meeting to a conclusion.

LONDON GASLIGHT COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held at the Freemasons Tavern, on Wednesday, April 9—JOHN ROBERT HALL, Esq., the governor, in the chair.

The SECRETARY (Mr. A. J. Dove) read the advertisement convening the meeting, and the following report and accounts were submitted:—

Annexed to this report, your directors submit the half-yearly accounts, showing the result of manufacture and distribution of gas up to the 31st day of December, 1872. After appropriating £750 to the redemption-fund, in accordance with the provisions of the London Gaslight Act, 1857, the sum of £29,317 8s. 11d. remains applicable to dividend. Out of this sum, the directors recommend that dividends be declared on all classes of preference stocks and shares, and also a dividend at the rate of 10 per cent. per annum on the ordinary stock. Such dividends to be paid on the 15th of April, 1873.

The rental for gas has increased by the sum of £4003 8s. 4d. during the half year, as compared with the corresponding period of last year.

The other products of manufacture show an increase, arising chiefly from the enhanced value of fuel. The circumstance has hitherto told favourably, by reason of unexpired coal contracts at comparatively low rates.

The recent state and prospects of the coal market have, however, required the very serious attention of the directors, and they have felt that the time has arrived when, from an increase of nearly 100 per cent. in the cost of coals, it has become imperative that the charge for gas should be increased.

Notice of an increase in price has therefore been issued to the consumers, which will come into operation from the first day of April.

It will be satisfactory for you to learn, that while great disturbance has existed in several of the gas-works of the metropolis, from strikes amongst their workmen, this company has scarcely suffered, the men having been well affected towards the company and its officers.

The works are in an efficient state, and the new gasholder approaches completion, although behind the period at which it ought to have been finished.

Two directors—namely, the Hon. Arthur Kinnaird, M.P., and Robert Henry Parkinson, Esq., retire by rotation, but, being eligible, offer themselves for re-election.

One auditor—namely, Hugh Oxenham, Esq., retires also by rotation, but, being eligible, offers himself for re-election.

A.—STATEMENT OF STOCK AND SHARE CAPITAL, *on Dec.* 31, 1872.

1. Acts of Parliament authorizing the Raising of Capital.	2. Description of Capital.	3. Maximum Dividend authorized.	4. Number of Shares issued.	5. Nominal Amount of Share.	6. Called up per Share.	7. Total paid up.	8. Amount issued but not paid up.	9. Remaining to be issued.	10. Total Amounts authorized.
15 Vict., cap. 82	Ordinary stock.	10 per cent.	Stock	Stock	Stock	£378,350	..	..	£378,350
	2nd pref. „	6 ditto.	Do.	Do.	Do.	14,450	..	..	14,450
	3rd ditto „	6 ditto.	Do.	Do.	Do.	4,350	..	..	4,350
	1st ditto „	6 ditto.	Do.	Do.	Do.	150,000	..	..	150,000
29 Vict., cap. 55	A ditto shares	6 ditto.	7622	£25 0 0	£12 10 0	144,863	£45,687	£109,450	300,000
20 & 21 Vict., cap. 73	Debenture stks.	5 & 6 ditto.	Stock	Stock	Stock	27,858	..	..	27,858
						£719,871			

B.—STATEMENT OF LOAN CAPITAL, *on Dec.* 31, 1872.

1. Acts of Parliament under which borrowed.	2. Description of Loan.	3. Rate per cent. of Interest.	4. Total Amounts borrowed at Dec. 31, 1872.	5. Remaining to be borrowed.	6. Total Amounts authorized.
15 Vict., cap. 82	Bond, &c.	4½ and 5.	£91,667	..	£91,667
29 Vict., cap. 55	Ditto	Do.	18,325	£71,332	100,000
			£109,992		

Total stock and share capital paid up (*see* A), £719,871; ditto loan ditto borrowed (*see* B), £109,992; total capital received, £829,863.

C.—CAPITAL ACCOUNT, *for the Half Year ended Dec.* 31, 1872.

Dr. *Cr.*

		Total to Dec. 31, 1872.			Certified Receipts to June 30, 1872.	Received during Half Year.	Total Receipts to Dec. 31, 1872.
1. To Expenditure, to June 31, 1872		£787,705 14 8	1. By Ordinary stock		£375,600 0 0	* £2750 0 0	£378,350 0 0
Since that date—			2. 2nd preference stock		16,200 0 0	†	14,450 0 0
2. New buildings, manufacturing plant, machines, storeage works, and other structures connected with manufacture	£7,294 3 4		3. 3rd ditto ditto		5,350 0 0	‡	4,350 0 0
3. Ditto mains and service-pipes, including laying same, paving, and other works connected with distribution	989 13 7		4. 1st ditto ditto		150,000 0 0	..	150,000 0 0
4. New meters, including fixing	631 14 6		5. A ditto shares, £25 each, including amount received in anticipation of calls		134,637 10 0	10,225 0 0	144,862 10 0
		8,915 11 5	6. Debenture stocks, under 20 & 21 Vict., cap. 73		28,173 17 6	¶	27,858 17 6
		796,621 6 1	7. Bonds and other loans		110,692 0 0	‖	109,992 0 0
5. Balance		13,608 17 6	*Note* † £1750 converted into ordinary stock.				
Total expenditure		810,230 3 7	‡ 1000 do. do.				
To balance of capital account		19,633 3 11	* £2750				
			¶ £315 redeemed.				
			‖ 700 do.				
		£829,863 7 6			£820,653 7 6	..	£829,863 7 6

D.—REVENUE ACCOUNT, *for the Half Year ended Dec.* 31, 1872.

Dr. *Cr.*

To Manufacture of gas—			By Sale of gas—		
1. Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£47,747 6 3		1. Common gas (418,976,800 cubic feet), at 3s. 9d. per 1000 cubic feet	£78,558 3 1	
2. Purifying materials, oil, water, and sundries at works	405 5 11		2. Cannel gas (20,139,000 cubic feet), at 5s. per 1000 cubic feet	5,034 15 4	
3. Salaries of engineers, including chief engineer, superintendents, and officers at works	1,547 9 6		3. Public lighting and under contracts (common and cannel gas)	9,965 11 2	
4. Wages and gratuities at works	10,369 9 11				£93,558 9 7
5. Repairs and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, and labour	11,910 3 1		4. Rental of meters		1,862 15 6
	71,979 14 8				95,421 5 1
Less old material sold	99 5 3		By Residual products—		
		£71,880 9 5	5. Coke, less labour and cartage	22,299 6 11	
5A. The Gaslight and Coke Company, for cannel gas		4,499 2 0	6. Breeze	978 17 9	
Distribution of gas—			7. Tar	5,154 19 0	
6. Salaries of surveyor, chief inspector, inspectors, assistant inspectors, and clerks in Light Office	1,697 5 0		8. Ammoniacal liquor	2,339 14 6	
7. Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour	4,054 7 0				30,772 18 2
8. Repairing, renewing, and refixing meters	1,634 13 5		9. Rents		1,506 1 6
		7,386 5 5	10. Transfer fees		7 17 6
Public lamps—					
9. Lighting and repairing		1,581 4 8			
Rents, rates, and taxes—					
10. Rents	921 8 0				
11. Rates and taxes	4,353 18 2				
		5,275 6 2			
Management—					
12. Directors allowances	900 0 0				
13. Salaries of secretary, accountant, and clerks, office-keepers, and messengers	784 3 8				
14. Collectors commission and salaries	933 15 7				
15. Stationery and printing	288 9 11				
16. General establishment charges and incidentals	378 13 8				
17. Company's auditors	50 0 0				
		3,335 2 10			
Law and parliamentary charges—					
18. Law	261 15 6				
19. Parliamentary (oppositions)	..				
		261 15 6			
20. Depreciation-fund for works on leasehold lands		100 0 0			
21. Bad debts		454 0 6			
22. Repairs of houses		173 1 9			
Total expenditure		94,946 8 3			
Balance carried to profit and loss account (E)		32,761 14 0			
		£127,708 2 3	Total receipts		£127,708 2 3

E.—PROFIT AND LOSS ACCOUNT (NET REVENUE), *for the Half Year ended Dec.* 31, 1872.

Dr. *Cr.*

1. To Interest on temporary loans and bonds		£2,811 15 1	1. By Balance of net profit brought from last account	£24,949 15 1	
2. Redemption-fund, reserve per London Gaslight Act, 1857		750 0 0	Amount brought from reserved fund account (F)	3,634 5 6	
Balance of net profit to be carried to next account, subject to half year's dividends		29,317 8 11		28,584 0 7	
			Less dividend paid for the half year ended June 30, 1872	28,584 0 7	
					..
			2. Balance brought from revenue account (D), being profit for the half year, to Dec. 31, 1872		32,761 14 0
			3. Interest on moneys deposited		117 10 0
		£32,879 4 0			£32,879 4 0

F.—RESERVED FUND ACCOUNT, *for the Half Year ended Dec.* 31, 1872.

Dr.		*Cr.*	
To Amount carried to profit and loss account (E)	£3,634 5 6	1. By Balance brought from last account	£23,052 15 11
Balance	19,784 16 4	2. Interest on amount invested	366 5 11
	£23,419 1 10		£23,419 1 10

G.—DEPRECIATION-FUND ACCOUNT (for Works on Leasehold Lands), *for the Half Year ended Dec.* 31, 1872.

Dr.		*Cr.*	
To Balance	£800 0 0	1. By Balance brought from last account	£700 0 0
		2. Amount brought from revenue account (D)	100 0 0
	£800 0 0		£800 0 0

H.—STATEMENT OF COALS, *during the Half Year ended Dec.* 31, 1872.

Description of Coal.	In Store, June 30, 1872.	Received during Half Year.	Carbonized or used during Half Year.	In Store, Dec. 31, 1872.
	Tons.	Tons.	Tons.	Tons.
Common	11,621·7	42,893·15	51,171·15	3,343·7
Cannel	1,106·18	3,453·4	2,792	1,768·2

I.—STATEMENT OF RESIDUAL PRODUCTS, *for the Half Year ended Dec.* 31, 1872.

Description of Residual.	In Store, June 30, 1872. Estimated.	Made during Half Year. Estimated.	Used in Manufacture during Half Year. Estimated.	Sold during Half Year.	In Store, Dec. 31, 1872. Estimated.
Coke—					
Common, Cannel	chaldrons, 36 bush. 200	49,011	11,288·4	35,482·8	2,440
Breeze	chaldrons. 50	6,617	583	5,614	470
Tar	gallons. 78,000	542,290	..	456,290	164,000
Ammoniacal liquor	butts of 108 g. 796	9,430	..	7,930	2,296

J.—GENERAL BALANCE-SHEET, *on Dec.* 31, 1872.

Dr.			*Cr.*		
1. To Capital account— Balance at credit thereof (Account C)	£19,633 3 11		1. By Cash at bankers, and in hand		£13,638 11 6
2. Profit and loss account— Balance at credit thereof (Account E)	29,317 8 11		2. Coals—for stock on hand	£6,703 7 10	
3. Reserved fund account— Balance at credit thereof (Account F)	19,784 16 4		3. Coke and breeze—ditto	1,614 15 3	
4. Depreciation-fund account (for works on leasehold lands)— Balance at credit thereof (Account G)	800 0 0		4. Tar and other products—ditto	2,190 6 1	
5. Redemption-fund	1,084 15 6		5. Sundry stores—ditto	3,195 4 11	
6. Unpaid dividends	3,400 6 10				13,703 14 1
7. Interest accrued and unpaid on bonds and other loans	1,311 13 9		6. Gas and meter rental—balance of this account due to the company, less deposits and prepayments	58,946 6 3	
8. Sundry tradesmen and others, for amount due for coals, stores, &c.	47,040 1 8		7. Coke and other residuals—balance of these accounts due to the company	12,323 1 11	
			8. Sundry accounts	4,342 2 9	
					75,611 10 11
			9. Investment account		19,418 10 5
	£122,372 6 11				£122,372 6 11

The GOVERNOR: Gentlemen, before I proceed to move that the report of the directors and the accounts laid before you be received and adopted, I feel it right to call your attention to one or two very important facts that have occurred during the half year as affecting all gas companies, I may say in England, but especially those in London. We have passed through a half year of considerable anxiety as to two important points—the rise in the price of coal to an almost unprecedented extent, and the strikes which took place among the workmen employed in gas-works during the month of December. Remembering those two facts, I cannot help feeling that it is satisfactory to find ourselves in our present position. We have suffered less from these two trying and unforeseen circumstances than some of our neighbours. The strike, as you are aware, was intended by the men to affect every gas company in the metropolis, and if it had been carried out as it was designed and desired to be, London would undoubtedly have been in darkness, because it would not be possible for those companies where it actually took place—especially the Chartered Company—to keep up the supply of gas within their respective districts. I am happy to say that the companies of London, whatever might have been their feelings one towards another in former years, have been acting very much in unison, and were thus enabled to assist one another where gas was required, and no company was able better to do that than this company. Common cause was made amongst us, and we were enabled to assist our neighbours, so that with very slight exceptions the supply of gas to the public was continued during the strike. The law was happily strong enough to punish those individuals who were foremost in the strife, and this company felt it their duty, with the others, to take some proceedings in the matter. But when the law had been sustained, and certain men were punished, this company were quite content to allow the men to return to their work where they were disposed to do so. The question of the high price of coal must have affected every one of you as householders and consumers, and it is a question which has had to be dealt with by this company in the best way we could, and inasmuch as the value of residual products has risen in a certain proportion, and we had some existing contracts for coal of a favourable character, we have been enabled to go through so far satisfactorily that we are now enabled to recommend the declaration of the usual rate of dividend. At the same time, with a view to meet the exigencies of the future, not knowing what the price of coal may be hereafter, we have, in common with some other companies, given notice to our consumers that the price of gas will be increased from the 1st of this month. Gentlemen, the report, though not very lengthy, does, I believe, deal with every subject which it is needful for the directors to bring before you in order to your understanding of the affairs of the company; but these two points affected us so much that I felt it important to call your special attention to them. I am not aware that there is anything else which has occurred in the half year to which I need now refer, and therefore I will conclude by moving—"That the report of the directors, and the accounts now laid before the meeting, be received and adopted."

Mr. HAWKINS seconded the motion.

Mr. DOANE asked whether the directors now required their men to sign a written agreement of service and to give certain notice before leaving their employment. If so, he would like to know the nature of the agreement and the notice demanded.

A SHAREHOLDER said a great deal had been written in the newspapers of late respecting new inventions. He would like to know whether, in the opinion of the company's engineer, any of these inventions had been attended with a sufficient degree of success to render it probable that the present mode of manufacturing of gas would be altered, or whether coal would still remain the staple for the manufacture of gas.

Mr. DOWNS said perhaps the chairman would at the same time give the meeting the benefit of his opinion upon the merits of the steam stoking apparatus, and whether it was likely to be of assistance to the company in the event of future difficulties with the men. He also wished to know by how much the company proposed to raise the price of gas.

Mr. FORD, referring to a question addressed to the chairman, said he thought it would be undesirable to discuss in a meeting of shareholders the details of arrangements made between the board and their workmen, or that the chairman should express any opinion respecting the merits of new inventions which might hereafter be adopted by the company.

A SHAREHOLDER said he thought there was an omission in the report, to which attention should be directed. Since the last meeting a vacancy had occurred at the board through the death of Mr. Lysley, and the directors had themselves filled up the vacancy. Perhaps the shareholders would be glad of some information in relation to that matter. Perhaps, too, the chairman would oblige by stating whether, after payment of the dividend for the last half year, the reserve-fund would remain intact.

The GOVERNOR: I have great pleasure in responding as far as in my power to the several inquiries made by the shareholders who have addressed us. With reference to one inquiry, I quite agree in the remark subsequently made, that it is not politic to discuss in this room the management of the internal affairs of the company. The Act of Parliament provides that the directors are to carry on those affairs subject, no doubt, to the control of a general meeting, but that acts done by the directors previously to being so controlled are not to be vitiated by anything that may occur thereafter. As a general rule (and I believe I have mentioned it in this room once or twice already), it would be very convenient to the directors if notice were given to them a day or two beforehand of any questions upon which, at these meetings, it was desired to obtain information from them. Frequently, in this room, questions have been raised in a general meeting which it would be for the interests of the shareholders should be considered in private by the directors before any discussion takes place thereon. And I cannot repeat too frequently that we are always happy to receive communications from the shareholders with regard to any points upon which they desire to be informed; but there are certain subjects which cannot be conveniently, in the interests of the company, discussed in a public meeting. Now, with regard to the contracts with our men, that subject has been taken into mature consideration by the board and the superior officers of the company, and we have exercised what we believe to be a sound discretion, bearing in mind what we know to be the law on the matter. Probably the honourable proprietor who asked the question will be satisfied when I state that fact to him. With regard to new inventions, our attention—my own, at all events—has, for the last 25 years, been directed to every invention that has been brought forward with a view to economy or improvements in the manufacture of gas. At one time it was proposed to make gas out of water, and it was thought that this would have a serious effect upon gas companies shares; but, I believe, in the result, it was found that the process was too expensive. As to the steam stoking apparatus, the London Company were, I believe, almost the first to permit a trial to be made of the steam stoker, at the expense of the inventors, at our works. I was solicited, as the chairman of this company, to become a director of that company, and our attention has been called to the merits of the invention. All I can say is that, whenever that company can show us that it will be to our advantage to use it at our works, we shall be most happy to do so. At the present moment I am not in a position to say that either of the new inventions which have latterly been placed before the public could be with benefit adopted by us—whether gas made from air will or will not travel, or whether the steam stoking apparatus can be practically adopted, I do not know, but it seems to me that the time has not yet arrived for us to enter into the question. As to the recent increase in the price of gas, I may state that it is an advance from 3s. 9d. to 4s. 6d. per 1000 cubic feet. Then I was asked as to the new director. You are

aware that we have lost the valuable services of Mr. Lysley. The law provides that when a director dies, the board may fill up the vacancy until such time as the deceased member would, in the ordinary course of things, go out of office by rotation. It is then for the shareholders to decide whether the gentleman so appointed shall be re-elected or some one else put in his place. Mr. Hare has accordingly been elected as *locum tenens* for the late Mr. Lysley until his term of office would have expired. The law authorizes it, and it is a convenient course in a large company like this. With reference to the reserve-fund, the amount to be carried to it after payment of the dividend will be £401 0s. 7d. We are happy not to have to draw upon the reserve to pay the dividend, as we might have had to do. We are now somewhat in a transition state, but we hope, when we have the pleasure to meet you at our next half-yearly meeting, we shall be able to give you as favourable a report as we do on the present occasion.

The motion was put, and carried unanimously.

The GOVERNOR then moved the following resolution—"That the following dividends—viz., the fixed dividends on all classes of preference stocks and shares, and a dividend at the rate of 10 per cent. per annum on the ordinary stock, be now declared, such dividends to be payable on the 15th inst."

The Hon. ARTHUR KINNAIRD, M.P., seconded the motion, which was put and carried.

The retiring directors and auditor were re-elected, and an addition of £50 per annum was made to the remuneration of the latter.

On the motion of the CHAIRMAN, seconded by Mr. HAWKINS, it was resolved that the salary of the secretary be increased £100 per annum from the commencement of this year.

Mr. DOVE returned thanks for the kind manner in which the proposition made by the directors had been accepted by the meeting.

The Hon. ARTHUR KINNAIRD proposed the following resolution—"That the special thanks of the meeting be presented to the engineer and officers for the exertions by which all disturbance of the company's business was avoided, and assistance was able to be given to other companies during the agitation and strike among the stokers of some of the metropolitan companies." He said it was a very gratifying thing to know that at the time of the strike not more than a dozen of this company's men, out of about 300 employed on the works, refused to do their duty, and that dozen would have been thankful to return to their posts within twelve hours. There could be no question that this excellent state of things was due to the liberal spirit evinced towards the men by the company's resident engineer (Mr. R. Morton), who had succeeded in acquiring the respect and confidence of his men, which was a matter of the utmost importance in the management of large works like these. Without their cordial sympathy and co-operation it would be difficult, if not impossible, to carry on the works successfully. The directors had marked their sense of the good conduct of the men by giving them and their wives two or three evening entertainments, a report of the proceedings at which had appeared in the JOURNAL OF GAS LIGHTING. He (Mr. Kinnaird) had the pleasure to preside at one of these meetings, and he certainly must confess he never spent a pleasanter evening. The men exhibited an excellent spirit, and entered very heartily into the entertainment provided for them.

Mr. CHRISTIE seconded, and Mr. HALLETT supported the resolution.

Mr. RAWLINSON: I have had a very large experience in my lifetime in the management of working men, and I must say in all my experience I have never come in contact with a man whose conduct I have more ardently admired than that of our engineer, Mr. Robert Morton. He not only looks after his men to see that they do their duty to the company who employ them, but as far as he possibly can he looks after their welfare, morally and religiously. He encourages them by his own example, and he gives them facilities for improving themselves. They have a school-room on the works, to which he himself devotes a great deal of time and attention, and I do believe that this practical regard for the improvement of the men is of far greater importance and value in their management than any mere slave-driving could be. You may rest assured that we should not have got through the ordeal of the strike on the favourable terms we did if it had not been for the kind conciliatory yet firm conduct of the engineer at the head of our works. I do not know what the exact money loss it was to us, but I have heard that the strike has caused one company to suffer pecuniarily to the extent of something like £50,000. But, apart from all money loss avoided, I congratulate myself on being associated with a company in which we are so well served by our officers, and I am sure you will join with me in congratulating our engineer on the success of his admirable management, and in the expression of a hope that he may be long spared to serve the company in his present capacity. Our thanks will be a gratifying testimonial to him, and this vote is no more than he richly deserves.

The resolution was very cordially and unanimously adopted.

A vote of thanks to the directors closed the proceedings.

THE OXYHYDRIC LIGHT.

(*Continued from page* 236.)

The report of M. Le Blanc, chief gas examiner to the city of Paris, commences with a short history of the invention of M. Tessié du Motay.

In 1867, MM. Tessié du Motay and Maréchal obtained from the Prefect of the Seine an authorization to make an experiment with their system of lighting on the Place de l'Hôtel de Ville. The light offered by the inventors was, in fact, the Drummond light, only in place of lime a cylinder of compressed magnesia was used. The oxygen for this experiment was made on the spot. Soon after, the inventor set up a manufactory for oxygen at Pantin, and compressed it in cylinders, like portable gas. The oxygen so made portable came into use at a few places, among others the saloon of the Théâtre de la Gaïté, which was lighted with coal gas burnt with oxygen supplied from cylinders deposited under the floor. About this time (1869) a company was formed to work the patents of M. Tessié du Motay, and they addressed a petition to the Prefecture for authorization to lay down pipes for the conveyance of oxygen, for lighting and other purposes, from the gasholder to the consumer, just as coal gas is supplied. The charge for oxygen to the city was to be about 3¼d., and to the private consumer about 7½d. per cubic mètre (35 cubic feet). The company further, relying on one clause in the agreement of the city with the Paris Gas Company, claimed authority to make a preliminary experiment with their system of lighting over a distance of a kilomètre (about two-thirds of a mile). In consequence of this demand the Prefect of the Seine nominated a commission, consisting of three eminent chemists and a leading engineer, with M. Le Blanc as secretary and reporter, with a view to determine the cost price of the oxygen produced in the factory of the company, and to advise as to the employment of the gas. The commission reported in February, 1870, and their report terminated with the following sentences:—"We have only been able to examine the system of lighting with the help of portable oxygen, the only plan at present in existence, and it suffices for lighting special places. In this case the reservoir of oxygen is never far from the burners, and it is possible to maintain uniformity of pressure in both cases. But grave difficulties would present themselves if the oxygen were brought from a distant factory by a special main supplying a large area. On this account the commission think that the greatest reserve is commanded, and that an experiment attempted prematurely on a large scale may lead to serious disappointments."

Soon after this report was made the company announced to the commission that they gave up the Drummond light, and that their new system was to inject oxygen into the axis of a flame obtained by the combustion of coal gas, previously charged with the vapour of a volatile oil rich in carbon. (M. Le Blanc here, in a foot note, reminds his readers of the experiments of M. Gaudin, made 30 years ago, who obtained a brilliant light by injecting oxygen into the flame of burning turpentine and other oils.) The new system of the Oxyhydric Light Company was, with the help of the portable oxygen, tried at several places in Paris, and in 1870 the Prefect of the Seine authorized the company to lay down the desired kilomètre of pipes. The situation chosen was the Boulevards des Italiens and des Capucins. Political events prevented the company from availing themselves of the authorization until early in 1872. At this time they hired a piece of waste ground in the Rue de Chateaudun, and there installed two "batteries" of cylinders, one series containing compressed Boghead gas, the other series compressed oxygen. From these they laid two sets of pipes to convey the separate gases to the public lamps on the boulevards. These arrangements constituted a direct infringement of the conditions under which the company obtained their authorization. By the use of the rich Boghead gas they avoided the difficulty, or perhaps the impossibility, of effectually carburating the gas at a distance, and also the difficulty of regulating the flames, which must have resulted from the employment of gas from a general system of mains, the pressure on which is liable to change at various points, and at the same spot at different hours of the evening. Further, it is clear that the oxygen delivered from a gasholder at a distant manufactory, and distributed over a large area, would also be subject to variable pressures in its course. Besides this, the reporter insists that the dearness of Boghead gas (30 francs per 1000 feet) removed the experiment from practical conditions.

M. Le Blanc next mentions the financial arrangements made by the Oxyhydric Light Company with the city of Paris, which we need not quote, and then refers to the promises made in the prospectus of the company. Speaking of the combustion of ordinary coal gas, the prospectus asserts that it is always smoky, reduces the amount of oxygen in rooms, and gives rise to insalubrious products. The new process, it goes on to say, obviates these inconveniences by sending, at the moment the gas issues from the burner, the oxygen necessary for its complete combustion. The particles of carbon being thus completely burnt, the light becomes white. The result is that with a burner consuming only 30 litres (a little more than half a foot) of coal gas and 16 litres of oxygen, a light is obtained equal to that produced by the consumption of 140 litres (2½ feet) of gas in the burners of the public lights of Paris. The economy is considerable; it allows the company to offer the oxyhydric light to consumers at a saving of 20 per cent. on the actual illumination, the company supplying all fittings without charge. M. Le Blanc points out that this prospectus makes no mention of the selling price of oxygen, and says nothing about the necessity for the carburation of common gas; and he adds the following observations:—It is not true that the combustion of the oxyhydric light is absolutely free from smoke. The combustion is not more perfect than that of gas under ordinary circumstances if the oxygen supplied is less than the quantity required for the complete combustion of the carbon and hydrogen, and if the oxygen is in excess, a very considerable diminution of light takes place. He adds that experiments have demonstrated that the statements relative to the illuminating power of the burner mentioned in the prospectus are not accurate, and therefore the pretended economy is a delusion. At the same time, it is admitted that with large burners better results may be obtained.

The next point discussed is the cost of oxygen. On this point, as said before, no reliable information could be procured, and M. Le Blanc can only express a strong opinion that the prices stated by the company—viz., 50 centimes per cubic mètre to the city, and 1 franc to private consumers (5d. and 10d. for 35 cubic feet) are much too low to be remunerative, regard being had to the expenses of distribution, interest on capital expended, &c. It must be mentioned that the price of oxygen just mentioned was to include the cost of carburetting coal gas, which the company puts at 1d. per 35 cubic feet, but which M. Le Blanc estimates cannot be less than 2½d.

M. Le Blanc proceeds to describe the experiments made with Boghead gas on the Boulevards, the results of which are the same as those arrived at by M. Louvet, already mentioned. The results with ordinary gas carburetted are next given, an example or two of which we may quote. With burner No. 2, the consumption of gas (carburetted) was 71·5 litres per hour, and of oxygen (with 20 per cent. of nitrogen), 27·5 litres per hour; the light obtained compared with the city burner consuming 140 litres of common gas, and considered as 1, was 1·3. With burner No. 3, consuming 110·2 litres of carburetted gas, and 60·5 litres of oxygen (with 13 per cent. of nitrogen), the comparison was more in favour of the oxyhydric light, 2·3 to 1. When, however, the cost of the two lights is compared, the estimate of the oxyhydric company being taken, the saving is found to be very small, at the best not more than 12 per cent.

The only other experiments we need quote relate to carburation, and we choose them because they show the cause of the failure of all systems of carburation hitherto employed. The oil used was distilled from Boghead coal, and had the density 790. Submitted to distillation,

23	per cent.	passed	over	between	55°	and	70° C.
39	,,	,,	,,	,,	70°	,,	85° ,,
22	,,	,,	,,	,,	85°	,,	100° ,,
16	,,	,,	,,	,,	100°	,,	121° ,,

Placed in the carburator, and weighed at fixed intervals, it was found that the following amounts of oil were volatilized for each cubic mètre of gas passed:—

1st	period,	266	grammes	per cubic mètre of gas.
2nd	,,	217	,,	,, ,,
3rd	,,	186	,,	,, ,,
4th	,,	121	,,	,, ,,

The illuminating power of the gas at the burner, of course, varied with the amount of oil volatilized. According to M. Le Blanc, the results with this somewhat heavy oil are better than those obtained with lighter petroleum oils, which, he says, are much less homogeneous and give still more variable results. With the best oils he states that the luminous effects vary very considerably at different periods of the volatilization, and it is impossible to keep the intensity of light constant. With ordinary gas, however, the consumer knows that a given quantity consumed will produce a sensibly constant light.

We need not follow the reporter through his remarks on M. Tessié du Motay's process for the manufacture of oxygen, inasmuch as we have reason to believe that it may be modified with advantage. In some of his conclusions we feel bound to express a limited concurrence. There may be a future for the oxyhydric light. That Paris or London should be *canalized* for the distribution of oxygen is little better than a dream. But oxygen compressed and made portable may possibly be applied in particular places (say to the footlights of theatres), where a specially brilliant light is desired. In any case, however, it must be borne in mind that it can only be advantageously employed with a rich cannel or with a carburetted gas. With gas up to 16 or 18 candle power it is decidedly disadvantageous. The oxyhydric light company have up to this time been unable to establish themselves in London, but if further attempts should be made the document mentioned below,* from which we have made these abstracts, will be found a useful guide to a critical examination of the scheme.

* "La Lumière Oxyhydrique: Décision prise par la Commission Municipale de Paris au sujet de ce nouvel éclairage; et rapports qui ont amené cette décision." Paris, au Bureau du Journal *Le Gaz*, 1872

SURREY CONSUMERS GAS COMPANY.

The Ordinary Half-Yearly General Meeting of the Shareholders of this Company was held at the Terminus Hotel, London Bridge, on Monday, April 7—T. Pocock, Esq., in the chair.

The Secretary (Mr. W. P. Boddy) read the advertisement convening the meeting, and the following report and accounts were then presented:—

The directors herewith submit to the shareholders the statement of accounts and balance-sheet for the half year ending the 31st of December last.

The operations of the company, during the above-named period, have not been productive of the same favourable results as hitherto, which is to be attributed—1. To the reduction in the price of gas from 4s. to 3s. 9d. per 1000 feet. 2. To the great rise in the price of coals, iron, and other materials. 3. To the increase of the rate of wages; and 4. To the disturbance caused by the strike of the stokers in December, which, for the time, necessarily entailed great expense, owing to the disorganization of the establishment, and the increased cost of carbonization. It will be, therefore, necessary to withdraw from the previous balance of revenue a sum of £5638 2s. to pay the statutory dividend of 10 per cent. per annum. When this dividend shall have been paid, the sum of £7121 5s. 2d. will remain to be carried to the credit of next account.

In view of the increased and increasing cost of manufacture, the directors have been compelled to raise the price of gas to the rate that prevailed up to the end of March 1872—namely, 4s. per 1000 feet.

The purchase of the freehold property, adverted to in the last report, has been completed, and the company are now in possession of premises which will enable them to extend the manufacturing power of the works, and fully satisfy the requirements of the public.

The directors have elected John Liddle, Esq., to a seat at the board, which had remained vacant since the death of George Virtue, Esq.

The directors who go out of office at this meeting are Cornelius Nicholson, Esq., and William Black, Esq., who, being eligible, offer themselves for re-election.

N. J. Powell, Esq., is the auditor, who also retires, and, being eligible, again offers himself for re-election.

Dr. *Revenue Account, for the Half Year ended Dec. 31, 1872.* *Cr.*

To Manufacture of gas—				By Sale of gas—		
Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£20,923 5 11			Common gas, at 3s. 9d. per 1000 cubic feet	£28,255 13 4	
Purifying materials, oil, water, and sundries at works	311 3 9			Public lighting and contracts	6,282 19 6	
Salaries of engineer and officers at works	520 0 0					£34,538 12 10
Wages at works	5,092 13 1			Residual products—		
Repair and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, labour, &c.	3,737 8 6			Coke, less labour and cartage	9,528 10 5	
	£30,574 11 3			Breeze	65 15 4	
Less old materials sold	130 1 0			Tar	2,031 18 6	
		£30,444 10 3		Liquor	350 0 0	
To extras for strike of stokers		1,516 5 11				11,976 4 3
Distribution of gas—				Rents		139 10 0
Salaries of inspector and clerks in Light Office	271 4 4			Transfer fees		4 15 0
Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour	3,616 0 10			Rental of meters		1,022 5 3
Repairing, renewing, and refixing meters	436 1 5					
		4,323 6 7				
Public lamps—						
Lighting and repairing		700 2 10				
Rents, rates, and taxes—						
Rents	98 6 10					
Rates and taxes	1,543 15 6					
		1,642 2 4				
Management—						
Directors allowances	750 0 0					
Salaries of secretary, accountant, office-keepers, and messengers	497 9 0					
Collectors commission and salaries	317 14 1					
Stationery and printing	163 7 2					
General establishment charges	238 1 3					
Auditors	42 0 0					
		2,008 11 6				
Law charges		43 3 8				
Bad debts		290 3 7				
Discounts		43 17 9				
Total expenditure		£41,012 4 5		Total receipts		£47,681 8 0
Balance carried to profit and loss account		6,669 3 7				
		£47,681 8 0				

Dr. *Capital Account, for the Half Year ended Dec. 31, 1872.* *Cr.*

	Expenditure to June 30, 1872.	Expended this Half Year.	Total to Dec. 31, 1872.		Certified Receipts.	Received during Half Year.	Total Receipts to Dec. 31, 1872.
To Expenditure	£267,066 1 10	£3,099 14 7	£270,165 16 5	By Ordinary shares of £10 each	£150,000 0 0		£150,000 0 0
Balance			5,483 3 7	Ditto shares of £10 each, £7 paid	69,984 0 0	£5 0 0	69,989 0 0
			£275,649 0 0	Mortgages and bonds	51,260 0 0	4,400 0 0	55,660 0 0
							£275,649 0 0

Dr. *Profit and Loss Account, for the Half Year ended Dec. 31, 1872.* *Cr.*

To Interest on mortgages and bonds, to Dec. 31, 1872	£1,307 6 0	By Balance of net profit brought from last account	£23,758 11 7	
Balance of net profit to be carried to next account, subject to half year's dividends, to Dec. 31, 1872	18,121 5 2	Less dividend paid for the half year ended June 30, 1872	10,999 4 0	
			£12,759 7 7	
		Balance brought from Revenue Account (No. 1), being profit for half year to Dec. 31, 1872	6,669 3 7	
	£19,428 11 2			£19,428 11 2

Dr. *General Balance-Sheet, Dec. 31, 1872.* *Cr.*

To Profit and loss account—		By Cash at bankers	£18,925 19 1
Balance at credit thereof (Account No. 3)	£18,121 5 2	Coals, for stock on hand, Dec. 31, 1872	1,350 0 0
Unpaid dividends	128 17 6	Gas-rental—	
Sundry tradesmen and others, for amount due for coals, stores, &c., to Dec. 31, 1872	21,488 5 11	Balance of this account due to the company on Dec. 31, 1872, less deposits and prepayments	23,034 7 11
Balance of capital account	5,483 3 7	Coke and other residuals	2,525 12 3
Depreciation fund	1,100 0 0	Sundry accounts	340 8 3
		Cash in office	145 4 8
	£46,321 12		£46,321 12 2

The Chairman, in moving the adoption of the report, said there was very little required on his part in the way of observation. The report was so explicit and clear that it gave to every shareholder reasons, and very sufficient reasons too, why it had been found necessary to reduce the previous balance of revenue in order to pay the customary dividend on the present occasion. Those reasons were stated consecutively—the reduction in the price of gas, the great rise in the cost of coal, the increase in the rate of wages, and the expenses attendant upon the recent stokers strike. Referring to the last subject first, he said the shareholders were all aware of the difficulties and troubles to which most of the gas companies in the metropolis were subject in the month of December from the strike. It was a matter much to be regretted that those foolish men suffered themselves to be deluded and misled by designing men, and without any real cause left their work, though receiving good wages, thus plunging their families into the greatest distress and misery. This company's engineer was aware of what they were about to do, and made an arrangement with Messrs. Docwra, the contractors, to supply him with a large number of men to fill their places, so that with their assistance the works were kept in operation, and the district continued to be lighted. If it had not been for this excellent and thoughtful management the consequences might have been very serious. He (the chairman) hoped that before the meeting separated the shareholders would record, by vote, their thanks to the engineer, the secretary, and other officers of the company, who exerted themselves in a most praiseworthy manner during the emergency. Looking at the report, he thought for his own part that they had not much to complain of—indeed, he felt that they had much to be thankful for. It might have happened that the whole of their undivided balance had been swept away instead of only £5638 being required to supplement the profits of the half year, so that they were still in a position to carry forward a very handsome surplus. He concluded by moving that the report be received, adopted, and entered on the minutes.

Mr. Bidmead seconded the motion, and congratulated the shareholders on the great success of the company under the trying circumstances of th ast half year. He thought the directors had made a very excellent bargain in the purchase of the freehold land at Rotherhithe, which would prove very useful to them in carrying on the business in future. It was very pleasing to hear that the strike had been so successfully met, and that they had such an able body of officers in charge of their affairs. Every one would regret that it had been necessary to trespass upon the balance, but the amount so withdrawn was less than might have been expected. The directors had done wisely in advancing the price of gas to its former rate, and he hoped they had satisfied themselves that 3d. was a sufficient rise to meet the circumstances of the case. He was pleased to see that Mr. Liddle had been elected to the vacant seat at the board.

A Shareholder said he had been over the freehold property purchased by the company, and thought the directors had acted very wisely in acquiring possession of it. It was gratifying to know that the cost of the strike was only about £1500, which was not a quarter of the sum that some other companies had had to pay.

Mr. Smith also congratulated the board on the purchase of the land at Rotherhithe, and said that in going over the works he had been surprised that their engineer had been able to produce such good results in the past, looking at the cramped and inconvenient space at his disposal. That Mr. Finlay succeeded so well in getting over the difficulties attending the strike reflected great credit upon him. Certainly he as well as the other officers of the company deserved some recognition of their services at the hands of the shareholders, who would, he was sure, be glad to learn that the directors had given them a more substantial token of their approval.

Mr. Franklin, while rejoicing that Mr. Liddle had been invited to a seat at the directors table, remarked that he felt a little wronged himself in the matter, as he was now deprived of the able dissection and analysis of the company's affairs which Mr. Liddle, as a shareholder, had been accustomed to favour the half-yearly meetings with.

Mr. JAMES, in answer to the last remark made by Mr. White, said the directors had recognized the services of their staff during the strike, and they were about that day to present to the engineer a valuable gold watch and chain for the able manner in which he then conducted the business of the company. They also proposed to make a similar present to the secretary.

The present for Mr. Finlay was exhibited—viz., a gold hunting, keyless, repeating chronometer, bearing the following inscription:—"Presented to Henry Finlay, Esq., C.E., by the Surrey Consumers Gas Company, for distinguished services. December, 1872."

A massive gold chain was attached, and the whole enclosed in an elegant morocco case.

Colonel BERESFORD, M.P., bore his testimony as a director to the services rendered by Mr. Finlay, to whose exertions he traced the success which had followed the company since the time of that gentleman's appointment as engineer.

Mr. DUVAL (deputy-chairman), replying to an observation by a shareholder, said whether the rise of 3d. per 1000 in the price of gas would be sufficient depended upon the future cost of coal and iron. At present the company had contracts for coal which were favourable, but when fresh contracts became necessary, unless a great change took place in the price of coal, the added 3d. would not enable the company to maintain their 10 per cent. dividend.

The motion was then put, and carried unanimously.

On the motion of the CHAIRMAN, it was resolved that a dividend of 5 per cent. for the half year ending the 31st of December last be declared, payable after the 15th inst.

The retiring directors and auditor were severally re-elected, and a cordial vote of thanks was given to the directors for their attention to the affairs of the company, which the chairman acknowledged, taking the opportunity to express his gratification that the election of Mr. Liddle to a seat at the board had given general satisfaction to the shareholders.

Mr. SMITH moved—"That a special vote of thanks be and the same is hereby given to Mr. Finlay, the engineer, to Mr. Boddy, the secretary, and to the staff of officers and servants of the company, for the great services rendered by them under the trying circumstances of the strike which occurred among the workpeople in December last."

The motion having been seconded by a SHAREHOLDER,

Mr. DUVAL, as a director, bore cheerful testimony to the energy displayed by the engineer at the time of the strike, and said that but for the foresight displayed by Mr. Finlay, and the efficient assistance rendered by Messrs. Docwra's men in the emergency, it would have been difficult, if not impossible, to carry on the works.

Mr. LIDDLE having corroborated these remarks,

The resolution was put, and carried by acclamation.

Mr. FINLAY acknowledged the vote. He said: I rise with a great deal of pleasure to return thanks for the very flattering reception you have given me to-day. And while doing so, I shall be pleased if you will allow me to acknowledge the valuable services rendered to the company by the clerks, collectors, storekeepers, inspectors—in fact, the whole of the staff appointed by the board at the time of the strike. Every one exerted himself to the utmost, and was there night and day for a week at my request. I am pleased in their absence to state this fact, because they deserve that it should be recorded. With regard to the testimonial to myself, allow me to thank you very sincerely. I feel it a great honour to receive this at your hands, and in leaving this meeting after the handsome compliment you have paid me, I shall be encouraged and strengthened to meet difficulties in the future, be they what they may. I have been with the company something like twelve years, and have done everything in my power to promote its prosperity. I trust I may long have the honour to serve you.

Mr. BODDY: Gentlemen, I am very glad to receive this expression of your approval and confidence. I thank you for the vote just passed, and can only assure you that I shall continue to devote my best energies to the advancement of the prosperity of the company, hoping that the same success may attend us in the future as in the past.

The proceedings then terminated.

WEST OF SCOTLAND ASSOCIATION OF GAS MANAGERS.

(*Continued from page* 232.)

Mr. MALAM (Dumfries) read the following paper on

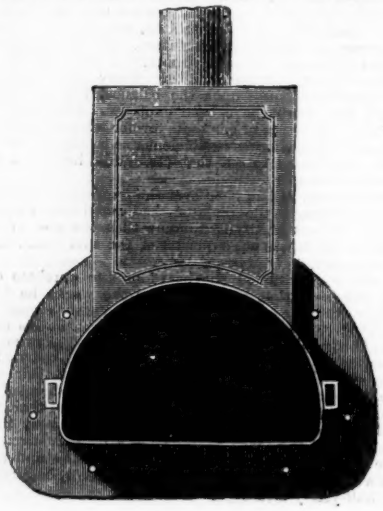
A NEW PATENT CONDENSING MOUTHPIECE, AND OTHER IMPROVEMENTS IN THE MANUFACTURE OF ILLUMINATING GAS.

My invention is designed to meet one of the greatest difficulties which has hitherto attended the carbonization of coal at high heats in the manufacture of illuminating gas.

In working at high heats hitherto, insurmountable difficulties have been encountered in the liability to deposition of earthy matters in the ascension-pipes, causing choking of the same, thus necessitating interruption in the working, and consequent loss.

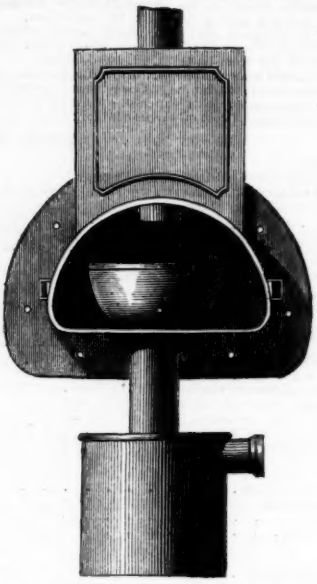
The inability to extract from coal at low heats the full quantity of gas contained therein has long been a recognized fact, and it is with a view to meet this difficulty that my invention is produced.

The principle of my invention consists in encasing the mouthpiece of the retort in part or in whole with water supplied through a self-feeding apparatus, from which a circle of jets discharge a regulated supply, which passes down the ascension-pipe, and is received in the chamber casing of the mouthpiece.

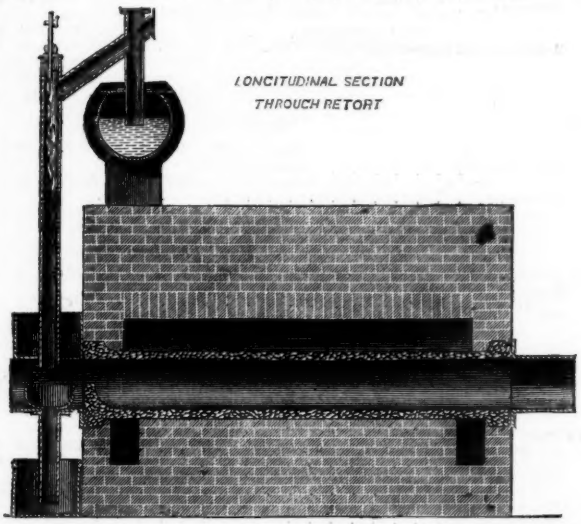


These improvements also embrace the continuous discharge of a stream or shower of water directly through the ascension-pipe and mouthpiece, which condenses and washes the gas. The mouthpiece, which is not confined to any particular shape, can be applied to any gas-retort in use.

When applied to the through retort, the mouthpiece and ascension-pipe are fitted on the back part of the retort and bench, the charge being inserted in the front, or opposite end, thus saving any interference with the mouthpiece.



In the through retort, the crude gas, before entering the mouthpiece, is made to pass over or through a regulated quantity of incandescent coke, placed against a shoulder, or projection, inside the retort, which materially assists in maintaining the heat, and in arresting and decomposing the hitherto undecomposed hydrocarbons, which would otherwise find their way to the condensers and form tar.



Not the least important part of the recommendation in favour of these improvements is the inexpensive facility with which they can be adapted to existing works.

Many improvements have been introduced in the manufacture of coal gas, which, but for the immense cost attendant upon their application, would have been practically valuable; but, hampered as many of them have been by complicated and expensive apparatus, their adoption has only taken place upon a very limited scale.

Having been engaged for a length of time in perfecting my experiments at the Dumfries Gas-Works, of which I have had the management for the last 20 years, I can speak with the utmost confidence as regards the improvements which I have to-day had the pleasure of introducing to your notice.

The saving effected by the use of the water-cased condensing mouthpiece alone has been at the rate of 10 per cent.; and so satisfied are the directors of the Dumfries Gas Company with what has already proved such an immense success, economically and pecuniarily speaking, that they have resolved to proceed at once with the entire remodelling of the whole of the retort-benches, inclusive of the through and shouldered retorts.

Based upon sound results in the shape of the great saving effected, this action on the part of the directors of the Dumfries Gas Company, on whose works the improvements have been so thoroughly tested by practical working, is the best certificate which can be produced of the great utility of my invention.

The present enormous price of coal, taken in consideration with the increased price of labour, makes the practice of the most rigid economy absolutely imperative.

Mr. MALAM, in answer to a question, said that the quantity of incandescent coke could be diminished or increased according to the amount of gas required to be taken off.

Mr. HALL (Port Glasgow): Is the water passed down the ascension-pipe, which finds its way to the tar-well, of any use?

Mr. MALAM: It is; by being returned and used over again till of sufficient strength, a loss in illuminating power is prevented.

Mr. KIRKLAND (New Cumnock): I have applied water on outside of ascension-pipes.

Mr. HALL: The plan is only available with through and through retorts.

Mr. MALAM: You can work with another mouthpiece in single retorts.

Mr. FOSTER (Portobello) asked what caused the increase of quantity of gas in this arrangement.

Mr. MALAM: The heated surface of coke decomposes the smoky matters not yet acted upon.

Mr. FOSTER: Do you not find the coke throws off a large quantity of impurities?

Mr. MALAM: The coke suffers no change; it is merely added to.

Mr. BLAIR (Alexandria): Is the water not decomposed to form gas itself?

Mr. MALAM stated that by this arrangement he could regulate the make of gas to take off a coal yielding 11,000 feet by the ordinary process, 12,000 and 13,000 feet. In the course of a few months he would have eight ovens completely fitted up, and would be happy to have tests applied. In one year he had required 6 retorts fewer, and saved 700 tons of coal.

Mr. KEY: You will employ motive power for the stream of water when your arrangements are completed. The only figures submitted are, that a saving of 10 per cent. is effected by using the condensing mouthpiece alone, without the washing and incandescent coke. If so, gas-works might profit by this in the prevention of chokes, thus saving labour and gas. I can confirm your experience of the saving effected by using strong heats and good coal by my own at Dumbarton.

Mr. FOSTER repeated his doubts as to impurities, and asked if more lime had to be used in purifying.

Mr. D. B. PEEBLES: I have had the pleasure of seeing the first part of Mr. Malam's scheme in operation, and the heats employed were as fine as I ever saw. The plan was very simple and very effectual in beginning the condensing of the gas. At the Leith Gas-Works I have tested the heats, and find that a mistaken idea prevails—viz., that the greatest heat is given off from the retort at the end of the charge. At the end of the charge I placed the thermometer 18 inches in the pipe before entering hydraulic main, and found the gas at 130° Fahr.; two hours after charging, at 340°; 15 minutes after charging, at 360°; at the beginning of the charge, at 400°. With the idea he had, he thought the gas must certainly come off cool at the beginning; but on inserting the thermometer it was seen to have greatly risen. Mr. Malam's appliances were very well adapted for keeping down this intense heat. We must all admire the ingenuity of Mr. Malam in the simplicity of his arrangements and the beauty of his models. The presence of water is known to be very deleterious to gas; but this water was applied in another stage, which makes all the difference.

Mr. HALL: What effect has this on the carbonizing up of the retort?

Mr. MALAM: That depends in all cases on your pressure.

Mr. PEEBLES: We would have liked, however, to have had some tabulated statistics of the impurities of the gas.

Mr. GRIEVE (Tranent): With the use of the incandescent coke, will the using of wet coals be an objectionable?

Mr. MALAM: Wet coals would still be detrimental to the gas.

Mr. D. B. PEEBLES: It is the same idea as "Fairbairn's smoke-consuming apparatus." In this, the back part of the fire was sloped down on an incline, and the angular compartment behind the fire-bars filled with glowing coke, which burns the smoke. It is the same principle, too, as the reversible fire-plate, now spoken a good deal about.

Mr. FOSTER: I have lately been using 8-feet instead of 10-feet retorts, and get not more gas, but better quality.

Mr. KEY: But you cannot compare your 10-feet retorts with Mr. Malam's, since your ascension-pipes were not at the back end like his, and the last 2 feet at the back of yours could not be said to be filled at all when the retort was charged.

Mr. HALL: The benefit is derived by the gas passing from the charging end to the outlet end, and over the incandescent coke.

Mr. MALAM explained his method of utilizing naphthas and light oils from condensers, by sending them on to a tray in the retort when the charge was off; and in answer to Mr. Black (Old Kilpatrick), said that in this case, by using this mouthpiece, there would be no chokes.

The PRESIDENT said: As there have been no decided objections raised against Mr. Malam's method of carbonizing, and as I have a favourable impression of the invention, I am prepared to adopt the arrangement so soon as Mr. Malam has his works fitted up, so that statistics could be shown relative to the production of gas per ton, its illuminating power, and amount of purifying material required to purify a given volume of the gas.

A vote of thanks was then accorded to Mr. Malam for his paper, and for the beautiful models submitted to the meeting, which was passed with applause.

Mr. BLACK (Old Kilpatrick) read the following paper on

OXIDE OF IRON AND ITS MANAGEMENT FOR THE PURIFICATION OF GAS.

You all know how it is formed; in that case I need say little, or give any lengthened discription, still I will borrow from one of the best geologists a few remarks (Sir C. Lyell). He says "oxide or bog ore is formed by water running over a strata of iron. The water charged with oxide has been allowed to saturate soil or bog for ages, until the surface has been converted into its present state."

Oxide is found in many parts of Ireland, but in my estimation Belfast ore is the best. Carrenloch and Londonderry are ports where it can be had in abundance. It is sent to this country generally in a rough state, just dug from the sod; in that state it must be stored up to rot in a dry shed, then cut up for using in the following manner:—Chop it small, but do not riddle it; add white pine sawdust, half a bag to the ton of oxide; turn up several times until the whole be well incorporated. Lime is sometimes mixed along with the oxide, but in my estimation lime, when mixed with oxide, has an injurious effect on the oxide, as lime will not give off the sulphur or other impurities (it may be said to waste good oxide by doing so) when exposed to the action of air.

Oxide of iron when new will ignite if left in a heap after having been in the purifiers. When lime and oxide are used, I would recommend separate sheds to be used, or that the lime in store be covered when the oxide is giving off the sulphur, as the lime will draw or absorb it to such an amount that if the outside of the lime be taken it will not run half the time it should do. In works where more than one purifier is in use, oxide may be worked with advantage. A lime purifier must be the last to pass the gas through, as oxide will not finish gas so pure as lime; but by changing the oxide often you can save a lot of lime. As to the thickness of oxide on each tier of sieves, that will depend on the use of an exhauster. Where that is the case, from 10 to 12 inches may be used, but I never put more than from 5 to 6 inches on each tier of sieves. Oxide does not get hard like lime, therefore there is no fear of caking; but to run an oxide purifier too long is not advantageous, and does damage to the oxide. Test-paper soiled in the least shows that it is time to change. That must be done with all speed, as oxide when new becomes hot, and spontaneous combustion may take place. Never allow dirty oxide much time. Put it into the barrows and wheel it to the shed at once; empty it in a heap, only till the purifier has been refilled and the cover put down, the oxide will then be smoking; spread it out on the floor, about 6 or 8 inches thick, and in half an hour again turn it all over; an hour may then be allowed to elapse, when a final turn will make ready for using again. Never damp or allow it to get wet till it be clean and cold. When putting it in purifiers a second time, damp the same as lime. To renew oxide, just put in a little fresh sawdust and fresh oxide; turn the whole up, and it will be ready again and may last for years.

In conclusion, I may state that I have worked the same oxide for six years, and at this date by changing oftener (the oxide) can purify 90,000 cubic feet of gas with 3 cwts. of lime, at a cost of ·53d. or a little over one halfpenny per 1000 feet.

The PRESIDENT remarked: We must all feel indebted to Mr. Black for his excellent paper. By the manner he is working with oxide of iron as an agent to purify his gas, it would be seen he was doing so to advantage. I have no practical experience in the working of oxide of iron, but may state, by way of comparison, that for the year ending May last, the expense for lime per 1000 feet over the whole year's working in Dumbarton Gas-Works was 1d. and ¼ of a farthing; so that Mr. Black. in a smaller work, is able to purify with the same oxide as he has been using for six years, at a cost for lime equal to a halfpenny per 1000 feet, or one-half the cost. This ought to be a subject for thought, and a reason for having oxide of iron in more general use in gas-works as a purifying material.

Mr. BLACK produced a specimen of the oxide of iron he is at present using, and, in an answer to a question, said he believed it could be obtained in Glasgow fresh at £3 per ton, and that it gradually gains in bulk and weight.

A hearty vote of thanks was awarded to Mr. Black.

Mr. KEY then read a paper on

AN IMPROVED OVERFLOW, WITH "FLUSHING-COCK," FOR HYDRAULIC MAINS, AND FITTED WITH A DIP INDICATOR.

This simple and effective apparatus, as designed and fitted up by me at the works of the Dumbarton Gaslight Company, has given entire satisfaction during the past winter, in regulating the working of one of the finest pieces of our machinery in gas manufacture—viz., the hydraulic main—in the ease with which the many hydraulic valves contained therein may be adjusted to whatever dip or pressure may be required on them, at the same time permitting the gas to escape from the retorts by the dips with an ease that I think cannot be improved, as well as in the means by which the inside of the main itself can be kept entirely clean and free from deposit.

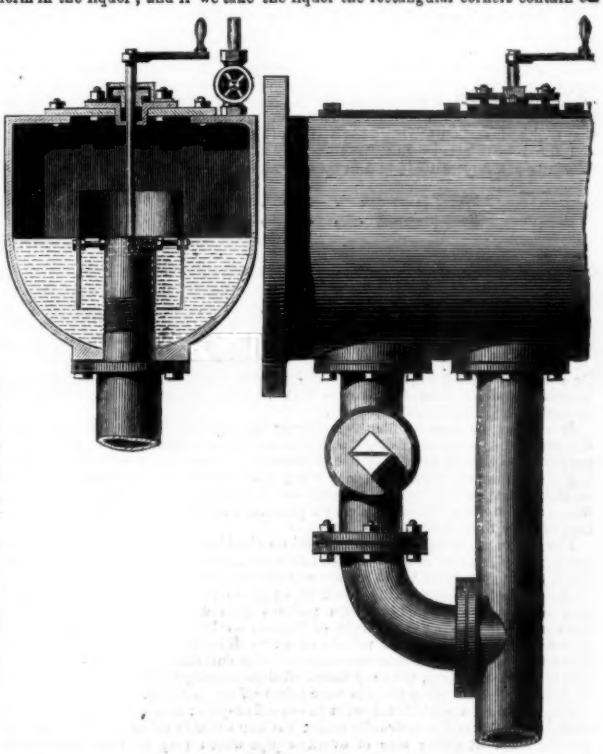
I have much pleasure in laying this subject before the members of the West of Scotland Association of Gas Managers for your consideration, trusting that the drawing before you is sufficiently plain to require few remarks from me, and relying not on this paper, but to the discussions it may elicit, to show whether my reasons for its being generally adopted be sufficient or not.

This subject of pressure on retorts is one well fitted to repay a little consideration and outlay by way of improved applications to existing hydraulic mains, and more especially at the present time, when gas coals have now reached with us a price generally more than double the sum paid for them little more than twelve months ago. I think there is generally, in works having no exhauster, a pressure maintained on the retorts at least double that indicated by a gauge connected to the hydraulic main, which cannot but prove a great cause of waste both, as you are aware, in loss of gas and in its illuminating power, together with increased trouble in keeping retorts free from carbon.

Before explaining the drawing, and my reasons for the construction shown, and how this improvement tends to lessen the pressure on retorts, thereby lessening these tendencies to waste, and that with very little attention, permit me to make a remark or two about the hydraulic main itself.

There is no shape of hydraulic main that can be rendered so efficient in working capabilities as, I consider, the D-shaped, and, when made symmetrical, no other form will look more pleasing to the eye, nor be found to serve the purposes for which it is made so well, whether it be of cast or wrought iron, provided that a suitable contrivance for its regulation and cleansing, when convenient, be properly applied to it.

It is formed square or rectangular on upper half, giving a flat surface for ease in fixing dip-pipe connexions, also increased internal capacity over round shaped, for passage of gas from dips to outlet, and being of a cylindrical form on lower half, thereby lessening the space only useful for containing the liquor necessary to seal the dips, it being quite unnecessary to retain more liquor in the main than is required to give a safe seal, and to show what a large quantity of tar not required is retained in the rectangular-shaped mains. Suppose we describe an imaginary circle inside of a square or rectangular main, the lower half of such circle passing through the liquor it contains, it at the same time describes the D-shape form in the liquor; and if we take the liquor the rectangular corners contain on



the outside of the circle, and put it into the D-shape form just described, supposing the inside of the circle to be dry, it will be found to be fully three-fourths, or very nearly the whole liquor required to form a proper seal, giving the utmost safety when worked with the apparatus I am about to describe, by which the seal can be increased at pleasure, thus showing sufficient proof that the liquor on the inside of the circle, which is the larger bulk of what is contained in the square hydraulic, is almost all unrequired, and that the forming of hydraulic

mains "square," as has been advocated, a delusion; and besides, I consider the latter form will give greater annoyance in requiring more labour to keep it clean. Owing to the broad and flat surface that has to be drained, deposits will lie on it, collect in the rectangular corners, and readily form an obstruction to the free flow of the heavy tar, thereby rendering it not so easily flushed out and cleaned by water as when made like the egg-shaped drain, which by the narrowed channel keeps it clean from deposit. The hydraulic main by an occasional flushing can also be kept clean by opening the valve for the purpose, which should be of sufficient size to allow of it being emptied in a minute or two, and by the application of a full supply of water, so easily procured in most towns, which may be let on by the ordinary fire-hose and couplings from the fire-plug to the hydraulic main. It may be flushed perfectly clean and filled again to its level in a remarkably short time, and when so copious a supply of water is not available, by merely opening the valve shown on the drawing, and allowing the heavy tar to drain off till the water alone comes, and filling it up again, the hydraulic can be kept free from deposit of thick tar.

The diagram before you is drawn to half size, and the section is through a D-shaped hydraulic main; the overflow-pipe shown is a 3-inch wrought-iron tube, screwed for a coupling, 5 inches long, to screw down on it. This coupling is made to fit easy so as to screw up and down by means of a spindle.

Immediately over this overflow-pipe is an opening or cleaning door on top of main, fitted with a cover secured by set screws. To this cover is secured the stuffing-box, through which is passed the spindle, which is fastened to screwed coupling, as shown, by a pin, a quarter of an inch in diameter, and about 9 inches in length. The centre portion, which is passed through coupling, being the only portion not screwed, it is passed through the end of the spindle, but not fitted tightly, and through holes drilled through and near the top of the coupling, and secured by back-nuts jammed tight up to the outside of the coupling. Round this upright overflow-pipe is hung a cylinder about 8 inches diameter, and the same in depth, and secured by the ends of pins already mentioned with back-nuts on the inside and outside. It is shown half into the water, to prevent the escape of water down overflow, from any commotion in the hydraulic, without passing up inside of and from under cylinder, which acts as a syphon. By it the heavy tar, as it falls to the bottom of the hydraulic main, is carried up a clear space of 2 inches all round, between the overflow and the inside of the cylinder; thus the whole of the tar is carried off before any water can descend to escape.

Ammoniacal water, then, is only left that upper portion of the main to seal dips, and rendering the passage of gas from the retorts as easy as it possibly can be, by having only the water to pass through.

The pressure on the inside of the retorts must vary according to the density of the liquor which seals the dip-pipes, as well as by the amount of such seal, and if there be supposed to be 3 inches of dip, and that in heavy tar, the pressure required to pass gas through this seal will be very much more than what it would be through water. Having fitted a large "Woolfe" bottle as hydraulic main with dip-pipe and connecting-pipes, with 3 inches of back pressure, filling bottle to give 1½ seal in ordinary tar, and setting it on a hot plate till the hand could not rest on it but for a short time for the heat, thus rendering the tar as liquid as possible. It required 8 to 9 inches of pressure from the inside of the retort to displace this 1½ seal, with a back pressure on the surface of 3 inches. With 1½ seal, in water, and same back pressure, it required $5\frac{3}{10}$ inches of pressure from inside of retort to permit the gas to escape therefrom. Thus you will observe the advantage of drawing off the tar first, and I have described on drawing by coloured dotted lines the probable depths of tar and water in hydraulic mains so fitted up, which shows that the tar rises very little above the bottom of this cylinder.

The spindle fixed as already described, and working through the stuffing-box, can be turned by a key or wheel fitted on it, which screws up or down the coupling on tube as required, thus lowering or raising the water-line.

The spindle is also graduated in ½-inch rings, and by having a level bar of sheet iron or brass (as shown fitted, and fixed by the nuts securing stuffing-box), the spindle can be so adjusted as to correctly indicate the amount of dip on the dip-pipes.

The first ring is cut at the level of the bar, which should be also the broadest, or marked thus ⊖, to denote that the coupling is then screwed down, so as to have the water at a level with ends of dips, and they just touching the water-line. Under and from this point every half inch represents on the spindle half an inch of dip, or equal to 1 inch of pressure, and by adding to pressure so indicated on the spindle the amount of pressure shown on the gauge which should be attached to hydraulic mains in every retort-house, you can readily arrive at the pressure that will be found on the inside of the retort when the dips are sealed by water, and the retorts are in full working. By experiments I have determined the following pressures with 1½ seal in tar and water, with 3 inch back pressure, viz.:

	Dip.		Press.
Water (say)	1½ in.	=	3 in.
Back pressure	3 in.	=	3 in.
Total			6 in.

Or a pressure of nearly 6 inches inside retort required to expel the gas.

	Dip.		Press.
Hot tar	1½ in.	=	6 in.
Back pressure	3 in.	=	3 in.
Total			9 in.

Or a pressure of $8\frac{3}{10}$ required to pass gas from inside of retort—an important knowledge, since it is desirable to have the dip no greater than is actually necessary to perfectly seal dip-pipes.

It will not be found an engineering or mechanical difficulty to have every dip-pipe cut to a uniform length on inside of hydraulic mains, as well as having it supported so that its level may not be disturbed by the rising or falling in heating and cooling of ovens, and I may say I have been working with five-eighths of an inch of seal on dips prior to turning on the pressure, being weight of holders, &c., equal to about 3 inches, giving a pressure on inside of retorts, when working, of fully *four inches*.

I find very many have 3 inches of seal on dip-pipes prior to valves to holders being opened, and with the water and thin tar flowing off from side of hydraulic main, leaving the thick tar to remain and settle to bottom. The pressure on inside of these retorts while working must be equal to the extra resistance found to pass the gas through this tar, with perhaps from 4 to 6 inches of pressure of working purifiers, &c., and weight of holders on hydraulic main. This would give a pressure on inside of retorts of 12 to 18 inches, or thereby, when about three-fourths of that pressure would be saved by curtailing the dip in dip-pipes by this screwing coupling, till they were sealed sufficiently to prevent the gas getting back to the retorts when the lids were taken off for charging.

I have shown a cock fitted with the overflow-pipe; it is a four-inch full-way cock for emptying the hydraulic main; but any suitable valve may be used, and can be fixed at either side of overflow-pipe which may be most suitable for draining.

By this, any day, all the year round, the heavy tar lying along the bottom, and moving towards the overflow-pipes, can be drained off, till only the ammoniacal liquor remains; and by always having a water-pipe fitted into hydraulic mains, with the tap at hand, in works not using an exhauster, and while the retorts are working, it may be emptied, a copious supply of water sent through it to clean the bottom, and then filled to proper level.

But with works having exhausters, I should say they have appliances whereby during the flushing of the hydraulic the crude gas from retorts can be sent into the atmosphere, by opening a valve on a pipe leading from the hydraulic main through the roof of the retort-house, while a valve on the outlet of the hydaulic main is shut. The service rendered by this flushing is of infinitely more importance than a 1000 feet or so of crude gas lost during the few minutes taken to clean out the hydraulic.

The conducting-pipe from overflow and valve can be taken from the underside horizontally, and, if more convenient than the method shown, carried at a declivity to tar-wells, &c.

By having a piece cast, and inserted or added to the end of the existing hydraulic mains, these arrangements may be adopted in any gas-works.

Mr. PEEBLES: The subject of mains has been recently discussed at a meeting of managers in London; it was there held that the mains were all too deep. Mr. Livesey had suspended a sheet-iron shallow tray in his main, and found that it carried away the tar nicely, and seeing that the space below was of no use, had dispensed with it altogether, making his mains very shallow, with a small gutter. With regard to Mr. Key's arrangement, it was a modification of Mr. Whimster's, of Perth, which gained a prize from the Royal Scottish Society of Arts some years ago. Mr. Boyd, of Alloa, had an invention for a similar purpose. Mr. Whimster had a syphon from the bottom of the hydraulic main, bent up to the level of the water. Mr. Boyd's was the simplest, consisting of separating the tar from the liquid. A piece of sheet-iron was placed, scarcely reaching the bottom, but reaching above the eduction-pipe. Mr. Key, however, could alter the level of the water at any time—a point which gas engineers had not given much attention to. It might be found that a lower dip might do.

Mr. JEFFREY: When you screw up the water to the level you want, and suppose an extra pressure comes on by putting on more retorts, or from a choke, does the water not run off and let the gas come back up the ascension-pipes?

Mr. HALL: You must set the water-line when everything is at rest, and screw up to whatever seal is required.

Mr. PEEBLES: An important thing in Mr. Key's invention is, that it gives the actual pressure in the inside of retorts. How long have you worked with this arrangement?

Mr. KEY, in answer to Mr. Peebles, remarked that he held the D-shaped hydraulic main as more serviceable than a flatter surface on bottom, and did not consider his arrangement a modification of any person's invention. He had been familiar with various means of drawing off the tar first for nine years, and the arrangement as shown on the diagram had been in use since last summer, and worked with ⅝-inch of dip and 3 inches back pressure, or about fully 4 inches pressure inside of the retort; and by the experiments he had gone into it was found that if 1½-inch dip in water gave 3 inches pressure, the same dip in tar gave 6 inches pressure.

In answer to Mr. Jeffrey, Mr. KEY explained that the cylinder being open at both ends the pressure acted equally on the inside and outside water-line, so that it could not rise on the inside to overflow by any extra pressure coming suddenly on the main, and said that 3 inches was his ordinary back pressure, but had had a choke in underground pipes when the pressure was raised to 8 inches; still the water maintained its level, and without the gas coming back into the retorts. To Mr. Hall he replied that the line on indicator denoting zero must be fixed when the water is at rest, and no back pressure on the main.

Mr. KEY brought forward an apparatus, and showed to the meeting, by glass hydraulic, dip-pipe, gauges, &c., that with 3 inches back pressure, and 1½ seal, it required about 5½ inches of pressure on inside of retort to expel the gas through this seal in pure water.

A cordial vote of thanks was bestowed on Mr. Key.

Mr. PEEBLES, on being asked, kindly explained the working of his patent lamp regulator to the members of the association, and by being fixed with a jet alongside of a jet direct from the main, and by varying the pressure, showed that the regulated jet maintained a uniform size of flame, in spite of such alterations of pressure. The jet from the main, when above the fixed rate of consumption the regulator jet was set at, varied up and down with the pressure. It was assumed that in one year the use of such regulators would save as much as pay their first cost.

A vote of thanks was given to Mr. Peebles.

The members of the association handled the specimen of coal and shale brought by Mr. Milne, of Edinburgh, from Australia, and sent to the meeting by that gentleman, to whom a vote of thanks was recorded.

An invitation was laid on the table to the members of the association from Messrs. Cameron and Roberton, to visit their pipe-founding works; but owing to the time occupied by business not permitting, the members and friends proceeded to Mr. Maitland's inn and dined together—Mr. Key, president, in the chair; Mr. Blair, vice-president, croupier.

FIRES IN THE METROPOLIS.

On the 27th ult., Mr. William Swanton, of the Metropolitan Salvage Corps, attended the Society of Arts Committee "On the means of protecting the metropolis against conflagration," and gave the following evidence on this subject:—

Q.—Being informed that you have acted for 18 years in the London Fire Brigade, and for some time as second in command of it to the late Mr. Braidwood, and that you are now, and have been for seven years, superintendent of the London Salvage Corps, whose duties to the fire insurance companies are to attend all fires, and to save and prevent damage to property as much as possible, the committee are desirous of obtaining the benefit of your long and close experience on the mechanical, structural, and administrative means of preventing conflagrations in the metropolis. Will you describe the nature of the arrangements you consider necessary for bringing to bear the whole of the water service of the metropolis to stay a conflagration in any part of it?

A.—I have for a long time considered the great advantages which must accrue from uniting all the water companies resources in London, with a view to preventing the possibility of there being a deficient supply of water for fires. Of course I am not now referring to the ordinary supply for domestic or other purposes, but solely in reference to fires. At present it frequently happens that the turncock is from home when a fire occurs during the day, and his absence is accounted for by the fact that he is in another part of his district turning on and off the intermediate supply to those localities then being served; and in consequence of being desirous to give a sufficient supply where he then happens to be, the other parts of his district are not only without his being directly available when called, but also the resources of those districts are for the time being concentrated to the particular neighbourhood in which he is working; leaving all the other districts on his beat unattended by a turncock, and necessarily deficient of prompt water supply in case of fire, unless some one happens to know how or where to find a supply from the main, the ordinary service-pipes being at that time, as a rule, without pressure; and if the mains of that particular company are under repair, so that for a time at least that locality is without water, under such circumstances nothing can be done to save the place burning if the fire has already gained the ascendancy. To obviate most cases of the kind I have referred to, I would suggest that all the water-mains and services be kept constantly charged. That every water company's main be joined (and regulated by a sluice-cock) to that of any other company nearest to its district, so that in case of fire or repairs two companies could be at once made available, and in this manner all the water supplies in London could be concentrated. That the present often obscure, and frequently unknown, plug supply should be superseded by standard hydrants in convenient recesses against a building, or in a box fitted at the base of the ordinary lamp-posts; in every case the presence of the hydrant being indicated by a coloured glass in the lamp or recess to which it is attached, and to ensure its being available at any and all times, every con-

stable should be furnished with a small key of these boxes, with which he could at once open the box and turn on the water. The key to which I refer should resemble those used by the postmen in opening the post pillar-boxes, so small and handy that it could not be considered inconvenient, the ordinary key to the hydrant being kept always within the hydrant box or post, and if the question of cost did not arise, I see no reason why each hydrant box, or every other at least, should not contain sufficient hose and branch pipe to enable every constable to endeavour to extinguish a fire on his own beat, while the engines were being brought to the spot. Of course, to ensure the complete and efficient working of the foregoing suggestions, attention must first be given to the constant supply of water in all mains at all times, and this I think could only be met by an Act which compelled every householder to keep the internal fittings in order, subject to occasional inspection, and to a fine for neglect in this respect, every building being supplied with a meter, and the water used paid for in the same manner as gas is now supplied. This question of using meters would, I believe, quite remedy any want of attention to the internal fittings, and would reduce the necessity for inspection to a minimum, besides acting as a check to the great waste of water which at present exists. Every meter being fitted with a key, the supply could be turned on and off at the will of the occupier, and thus necessarily ensure a reduction of charge in the event of a family being from home for any length of time, besides the facilities which would then be at hand for keeping the water out of any building, without interfering with others, while the internal fittings were under repair, or in the event of accident.

Q.—As you have had occasion to suggest arrangements of the water supply for protection of particular public buildings, will you describe those arrangements?

A.—There can be no doubt that many of the serious fires which have occurred in London might, in a great measure, have been averted, if a supply of water under pressure, with proper appliances and arrangements, had been fitted in convenient positions, and it is to be regretted there is not some authority who could insist upon such precautions being taken in every large building, the contents of which would produce an extensive fire in itself, and seriously endanger a whole neighbourhood if water was not forthcoming from the street mains in sufficient quantities, or if severe frosts prevailed at a time when a gale of wind was blowing. I am strongly of opinion that all large buildings, containing say 216,000 cubic feet of space, should have these appliances charged and fitted, to the satisfaction of some authority, and that in proportion to the size of the building, so the appliances should be the more complete and sufficient for the increased area, and if something like periodical inspection were established in respect of these buildings and fittings, I believe many serious fires would not occur, especially among the large mercantile warehouses.

Q.—Would it not be necessary, to facilitate the adoption of such mechanical arrangements, and inspections for keeping them in order, that the water supplies should be placed on a public footing?

A.—It would no doubt be better if the whole water supply of London were under one control, all the present sources contributing to one of constant supply and great pressure, whereby so much fire-engine power would not be required for the purpose of extinguishing fires, as is already proved in Liverpool, Glasgow, and other places, where the mains are under constant pressure. The hydrants might then be used for cleansing the streets, or any other purpose, and the frequent use of them would only make them the more reliable when wanted for a fire. Half the number of men now required for an engine would then answer the purpose, still keeping in view the good service to be rendered by the police, who could act as firemen till the regular brigade arrived.

Q.—What proportion of fires do you consider are raised for insurance money?

A.—It is difficult to tell the proportion of fires which have been raised with a view to obtain the insurance money, as no doubt a great number of them have been settled in a liberal manner, and in consequence of the position of the parties they have not even been suspected at the time of settlement, whereas circumstances have subsequently come to light which left no doubt on the minds of some authorities that those fires were the work of an incendiary, either in the person of the principal himself, or by agents made use of for the occasion, several of whom, being dissatisfied with their reward, or as the result of a quarrel, have, at some future time (when too late), spoken freely upon the subject. The only remedy, then, open to the fire offices is to use great caution when insurances are offered, and even this remedy fails when other names and new businesses are adopted by these same people. I quite believe that if many evil-disposed persons knew a fire would be quickly extinguished, and their plans revealed, when contemplating incendiarism, they would not attempt the firing as frequently as has been the case, and, in proof of this supposition, it is a fact that very few fires occur near fire-engine stations, and, therefore, by the street hydrants I have proposed, with the police aid suggested, a great check would be brought to bear upon this class of persons.

Q.—What do you find to be the chief causes of accidental fires?

A.—Temporary stoves improperly constructed, defective gas lighting arrangements, and improper receptacles for ashes, are perhaps among the most frequent causes of unintentional fires. And these are quite common in buildings let off to several tenants and occupiers, where in many cases, after the landlord or agent lets a room or floor, he does not take the trouble to see what is going on within, so long as the rent is regularly paid. Nothing short of occasional inspection can remedy this state of things, or properly-arranged agreements from the landlord to the tenant, restricting him from liability for any fire arising from these causes, by stipulating that a tenant shall not fix or use any of these things without the consent of the landlord, and he being restricted on his part till notice has been given, and an inspection made by some competent authority, who could have no interest in the matter beyond looking to the public safety. The only supervision in this respect now exercised is that by the fire offices at the wharves, docks, and some of the wholesale warehouses, where it is believed many accidents have been averted, principally owing to the suggestions given from time to time.—*Journal of the Society of Arts.*

Wakefield Water-Works Company.—A few weeks ago the Corporation of Wakefield decided to oppose an application made to Parliament by this company for additional capital and increased powers, and as the expenses of the opposition could not be legally defrayed out of the borough funds, nearly £1000 was subscribed by some of the leading inhabitants to carry on the opposition. A day or two before the matter came before a committee of the House of Commons, a sub-committee of the corporation had interviews with the directors of the company, in London, and it was agreed that the company should withdraw their proposed new source of supply, and their extension to outlying districts, to limit their application for borrowing powers for new share capital to £30,000; that £20,000 of the new capital should not be spent without the consent of the corporation; the new shares to be taken by the corporation at par; that the directors should submit the offer of the corporation of £48 for each paid-up £25 share to the shareholders of the company, and that, should the offer be accepted, the sub-committee would recommend the Town Council to purchase the works. On Wednesday, the 3rd inst., an extraordinary general meeting of the shareholders of the company was held to take into consideration the offer made by the corporation. It is understood that the directors recommended the shareholders not to accept less than £50 per share, and that their recommendation was agreed to. On the same day, at the ordinary monthly meeting of the Town Council, a discussion took place, it having become generally known, although no official intimation had been received, that the shareholders of the water-works company had declined to accept the offer of the corporation. No resolution on the subject was proposed.

Register of New Patents.

1752.—Hengst, C. F., Fulham, and Muschamp, J. B., Kensington, "*Improvements in the manufacture of gas, and in the apparatus employed therein.*" Patent dated June 11, 1872.

This invention relates to improvements in the manufacture of gas for lighting and heating purposes, with coal, shale, or schist, or other known, or similar, or equally applicable carbonaceous substance, and also to improvements on or in connexion with apparatus hitherto used for or in the production of such gas. According to this invention a horizontal retort is used, made of either iron, clay, or other suitable material, and set and heated in any known or suitable manner, and provided with apparatus for the admission of steam to the retort. The substance from which the gas is generated, when a solid is to be used in a state of fine subdivision, though this is not absolutely essential. When a red heat has been obtained steam is introduced into the retort by means of pipes, and is heated to a red heat. The pipes traverse the retort throughout nearly its entire length at about one inch from the bottom, and are perforated or slotted on their under sides, through which perforations or slots the steam escapes into the retort. By this arrangement the pipes are thoroughly embedded in the incandescent fuel, and the steam escaping from the apertures comes in immediate contact with the heated bottom of the retort, the object being to introduce the steam in such a manner that it will always be heated to a red heat before mixing with the coal, and will also have all to pass through the coal or other substance so that it may come in contact with the largest possible portion thereof before passing out of the retort as gas, care being taken that no more steam is admitted than found necessary to supply such quantity of hydrogen gas as will so unite with the carbon of the coal or other substance as to give the best results, the admission of steam being regulated by a cock or other suitable contrivance. The gas thus generated is caused to pass from the retort through a series of purifiers or converters surrounding the retort, and made to communicate with it and with one another by means of suitable connexions.

These converters are filled with pumice stone, or other similar porous substance, and are placed round the retort at about equal distances apart. They and their contents are also heated with the retort as circumstances may require, and sometimes are made of different diameters to one another, that one into which the gas first enters from the retort usually being the largest. This process, combined with the after passage of the gas through the condenser, renders the gas almost absolutely pure.

1768.—Anderson, G., and Buchanan, J., both of Dalmeny, N.B., "*Improvements in apparatus for drawing the charge from retorts employed in making gas or oil.*" Patent dated June 12, 1872.

This apparatus consists of a continuous or jointed metal rod or bar, or of a chain fitted with a plate or series of separated plates. It is placed in the retort before or during charging, remains therein during distillation, and is withdrawn when distillation has been effected, bringing with it the whole of the spent charge.

1771.—Shanks, H., South Queensferry, N.B., "*Improvements in drawing retorts, and in the means employed therefor.*" Provisional protection only obtained. Dated June 12, 1872.

The feature of novelty which constitutes this invention is the employment of an instrument consisting of a rod having a series of "clats," or rakes, varying in size from the mouth of the retort backwards, having perforations for allowing the vapours to escape.

1783.—Lake, W. R., Southampton Buildings, London, "*Improvements in rotary pumps and engines, and in means for effecting the transmission of power thereby, parts of which improvements are applicable to the construction of rotary blowers and ventilators.*" A communication. Patent dated June 13, 1872.

This invention is divided into two parts, one being the application of it as a pump, the other as an engine. The water is in both cases brought to and discharged from the machine tangentially to the direction in which it flows, and the supply is effected at a distance from the centre almost as great as that at which it takes place. This is accomplished by so shaping the circular casing as to form therein two chambers or passages, one of them at the periphery of the casing being shallow at the beginning, and continually increasing in depth until, arriving at that part of the circumference from which it started, its area becomes equal to the area of the pipe. The inner side of this chamber or passage being circular, the outer side forms the curve known as a spiral or helix. The second, or inner chamber or passage, is formed in the casing near the outer one, and between it and the centre of the circle it may conveniently be divided into two, one on each side of the casing. This inner chamber is shaped similar to the outer, but the curve of the inner is made to run in the opposite direction to that of the outer chamber, and the area of the inner continually increases until it is at least equal to the area of the pipe in which it terminates. The invention is also applicable, by the substitution of air in place of water, for the purpose of a rotary air-blower, and rotary ventilator, and for a compressed air-engine, also for the purpose of transmitting motion and mechanical power, through the medium of water, by connecting the water-engine with this or any other suitable pump.

1789.—Browning, J., 63, Strand, "*Improvements in photometers.*" Provisional protection only obtained. Dated June 13, 1872.

This invention relates to improvements in photometers, or apparatus by which the intensity of light can be measured, and consists in fitting in a tube one or more diagonal mirrors or total reflection prisms, or reflective bodies, so arranged in connexion with apertures that the light from, say, two gas-flames, or other sources of artificial light, is received through the apertures, and reflected to the opposite end of the tube, in which an eye-hole fitted with a lens or not is arranged. Outside of the tube at the apertures one or more revolving sockets is or are arranged, in one of which a wedge-shaped glass (tinted) is free to be slid, so that when the two lights are of different intensities the wedge piece is slid more or less into the socket until the reflections of the two lights are equalized. The wedge-piece is graduated, so that the distance it is pushed in indicates the difference in brilliancy between the two lights. The other socket is fixed, and holds a tinted piece of glass in position at its aperture; by this means, if the two glasses are of the same tint, the same appearance or colour will be obtained from the two lights. Thin paper, ground glass, or opal glass, can be arranged in the front of moveable diaphragms which are fitted at the apertures to soften the light, and thus render the difference more easily appreciable.

According to another arrangement the diagonal mirrors or total reflection prisms are dispensed with, and a single prism of a very obtuse angle, with the apex towards the eye-end of the instrument, is substituted; this prism may be of white, coloured, or black glass, or it may be silvered on the two outside reflective surfaces.

1880.—Morgan-Brown, W., Southampton Buildings, London, "*An improved apparatus for extracting ammonia in the form of liquid ammonia from crude ammoniacal liquor.*" A communication. Patent dated June 22, 1872.

This invention consists in an apparatus for obtaining pure liquid ammonia from the crude ammoniacal liquor of gas-works, &c., at one operation. The liquid with lime is heated in a closed vessel, the escaping gas entering another vessel containing also crude ammoniacal liquors mixed with lime, thereby becoming enriched. The gas is thence carried into condensing and purifying chambers or vessels till it is finally condensed into pure water, and of sufficient quality and strength for commercial purposes.

1898.—ATKINS, T., St. Alban's, "*Improvements in pumps, parts of which improvements are also applicable to other purposes.*" Patent dated June 24, 1872. The novelty of this invention consists in the general construction of the pump and in the particular formation of the valves, and what is termed the valve-boxes, which are so contrived in relation to one another that the valves may be replaced without taking the pump in pieces.

APPLICATIONS FOR LETTERS PATENT.

937.—DEACON, G. F., Liverpool, "Improvements in apparatus for measuring the flow of water in pipes." March 14, 1873.
948.—MILLS, R., Upper Norwood, Surrey, "Improvements in gas-furnaces." March 15, 1873.
963.—GARDNER, H., 18, Clifton Road, Holloway, "Improvements in apparatus and means for utilizing spirituous substances and oils for the purpose of producing artificial light and heat." March 15, 1873.
967.—HASELTINE, G., Southampton Buildings, London, "Improvements in pump-pistons and valves." A communication. (Complete specification.) March 15, 1873.
993.—MERRIMAN, J. D., East India Road, London, "Improvements in apparatus for lighting and extinguishing public and other lights." March 18, 1873.
1002.—PERRIER, J., Bedford Square, London, "Glass gas-chimney, capable of resisting any degree of heat without bursting." March 19, 1873.
1012.—JAYNOR, A., Regent's Park, London, "Improvements in the construction of automatic telegraphs, to be worked by air, steam, or gas." March 19, 1873.
1046.—BAGGS, I., High Holborn, London, "Improvements in the manufacture of gas for illuminating and other purposes." March 20, 1873.
1063.—PALMER, G. B., Hammersmith, "Improvements in ball-valves." March 21, 1873.
1066.—JOBSON, E. W., Derby, "Improvements in apparatus for controlling the supply of water to water-closets, urinals, and such like places, and in effecting the measurement of the water supplied for such and other purposes." March 21, 1873.
1086.—SKOINES, H., Argyle Street, King's Cross, "An improved combined apparatus for manufacturing gas for lighting, heating, and cooking." March 24, 1873.
1123.—MOODY, E. T., Templecombe, Somerset, "Improvements in the manufacture of illuminating gas." March 26, 1873.
1193.—CLARK, A. M., Chancery Lane, "Improvements in apparatus for the manufacture of gas for lighting and heating purposes." A communication. March 31, 1873.
1219.—SILVER, T., New York, "An improved air-rarefying lamp-burner." April 2, 1873.
1244.—THOMAS, A., gas-works, Alton, "Improved means of and appliances for relieving gas-retorts from pressure, and for hermetically sealing the joints of hydraulic and other mains of gas-works." April 3, 1873.

GRANTS OF PROVISIONAL PROTECTION.

807.—WISE, W. L., "An improved air-gas apparatus, with injector for the self-regulating production of gas from volatile fluids." A communication. March 5, 1873.
846.—SKOINES, H., Argyle Street, King's Cross, "Improvements in the manufacture of gas and in the treatment of the residues therefrom, and in the combination of gases for the production of light and heat, and in the apparatus employed therein." March 8, 1873.
907.—TYLOR, A., Newgate Street, "Improvements in apparatus and arrangements for measuring water and regulating, controlling, and arresting the water supply of water-closets, baths, lavatories, and urinals for domestic use, and preventing waste." March 13, 1873.
912.—SYMINGTON, R. S., Glasgow, "Improvements in apparatus for dealing with sewage and other refuse or waste, so as to lessen the pollution of rivers." March 13, 1873.
933.—LAKE, W. R., Southampton Buildings, "Improvements in rotary pumps for lifting and forcing water." A communication. March 14, 1873.
937.—DEACON, G. F., Liverpool, "Improvements in apparatus for measuring the flow of water in pipes." March 14, 1873.
963.—GARDNER, H., Clifton Road, Holloway, "Improvements in apparatus and means for utilizing spirituous substances and oils for the purposes of producing artificial light and heat." March 15, 1873.
993.—MERRIMAN, J. D., East India Road, "Improvements in apparatus for lighting and extinguishing public and other lights." March 18, 1873.
1002.—PERRIER, J., Bedford Square, "A new glass gas-chimney, capable of resisting any degree of heat without bursting." March 19, 1873.
1046.—BAGGS, I., High Holborn, "Improvements in the manufacture of gas for illuminating and other purposes." March 20, 1873.
1047.—DOTY, H. H., Bury Street, St. James's, "Improvements applicable to burners for railway and other lamps." March 20, 1873.
1063.—PALMER, G. B., Hammersmith, "Improvements in ball-valves." March 21, 1873.
1066.—JOBSON, E. W., Derby, "Improvements in apparatus for controlling the supply of water to water-closets, urinals, and such like places, and in effecting the measurement of the water supplied for such and other purposes." March 21, 1873.
1072.—HARRISON, C. W., High Holborn, "Improvements in apparatus for charging or impregnating atmospheric air with the vapour of hydrocarbon liquids." March 22, 1873.
1123.—MOODY, E. T., Templecombe, Somerset, "Improvements in the manufacture of illuminating gas." March 26, 1873.

NOTICES TO PROCEED.

3473.—HARRISON, C. W., and HARRISON, A. H., High Holborn, "Improvements in apparatus for charging or impregnating atmospheric air with the vapour of hydrocarbon liquids." Nov. 20, 1872.
109.—CLARK, A. M., Chancery Lane, London, "An improved method of and apparatus for condensing liquefiable matters contained in gases and vapours." A communication. Jan. 10, 1873.
115.—HOLMAN, S., Laurence Pountney Lane, London, engineer, "Improvements in gas-retort mouthpieces, lids, and fastenings." Jan. 11, 1873.
136.—HOLMAN, S., Laurence Pountney Lane, London, engineer, "Improvements in apparatus for raising and lowering heavy bodies, particularly applicable to the lids of gas-purifiers." Jan. 13, 1873.
248.—ROBERTSON, J., Nitshill, N.B., "Improvements in machinery or apparatus for forcing, exhausting, or measuring air, gas, or other fluids or liquids." Jan. 21, 1873.
372.—JONES, D., Inverness, mechanical engineer, "Improvements in apparatus for forcing in liquids or fluids, applicable to forcing inflammable fluid or liquid into furnaces of various kinds and at various pressures, whether of kind or degree." Jan. 30, 1873.
430.—TAYLOR, J., gas manager, BUCKLEY, S., engineer, and CHADWICK, T. H., gas collector, Oldham, "Improvements in machinery or apparatus for drawing and charging retorts used in the manufacture of illuminating gas." Feb. 5, 1873.
823.—WRIGHT, W., Sheffield, "Improvements in the manufacture of gas for heating and illuminating purposes, and in apparatus for the same, parts of which are applicable to other purposes." March 7, 1873.
907.—TYLOR, A., Newgate Street, "Improvements in apparatus and arrangements for measuring water and preventing waste." March 13, 1873.
933.—LAKE, W. R., Southampton Buildings, "Improvements in rotary pumps for lifting and forcing water." A communication. March 14, 1873.
1046.—BAGGS, I., High Holborn, "Improvements in the manufacture of gas for illuminating and other purposes." March, 20, 1873.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

2948.—AITKEN, P., Glasgow, "A new or improved gas cooking and heating apparatus or stove." Oct. 7, 1872.
2976.—FISHER, W. D., Glasgow, "Improvements in apparatus for and connected with the manufacture and use of illuminating gas, parts of which are applicable to other purposes." Oct. 10, 1872.
2990.—BAGLEY, R., Birmingham, "Improvements in holders or galleries for the shades or globes and chimneys of gas and other lamps." Oct. 10, 1872.
3028.—SCOTT, H. Y. D., Ealing, "Improvements in apparatus for the treatment of sewage." Oct. 14. 1872.
385.—BROEL, J., South Kensington, "Improvements in apparatus for lighting and heating." Jan. 31, 1873.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

631.—NEWTON, A. V., "Improvements in fluid meters." March 3, 1870.
689.—PRESTON, G., and PRESTIGE, J., "An improved apparatus for preventing waste of water in dwellings and other places where the constant-supply service is laid on." March 3, 1870.
706.—WINDER, C. A., "An improved apparatus for use in drawing and forcing air, water, and other fluids." March 10, 1870.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

478.—YOUNG, J., "Improvements in distilling coal, shales, and other substances." Feb. 15, 1866.
498.—WELCH, E. J. C., "Improved apparatus for carburetting air and gas." Feb. 16, 1866.
539.—SWIFT, H. S., "Improvements in the construction of pumps." Feb. 21, 1866.

DUKE OF HAMILTON'S
LESMAHAGOW GAS COAL.

LESSEES:

LESMAHAGOW AND LONGLEE COAL COMPANY,

Office—5, DIXON STREET, GLASGOW.

Works—BLACKWOOD & SOUTHFIELD, LESMAHAGOW

English and Foreign Agents:

JAMES MILLER, SON, & CO.,

9, GRACECHURCH STREET, LONDON, E.C.,
AND
75, UNION STREET, GLASGOW.

BEALE'S IMPROVED PATENT GAS-EXHAUSTERS,

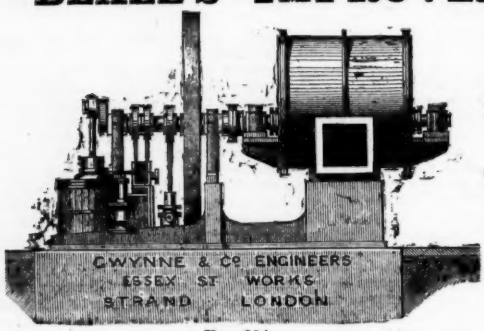


FIG. 224.

WITH
GWYNNE & BEALE'S
PATENT
IMPROVEMENTS,
Made under the personal superintendence of
Mr. BEALE,
The oldest Maker, Inventor and Patentee of GAS-EXHAUSTING MACHINERY.
It is NOT CORRECT to state that Mr. BEALE has RETIRED.

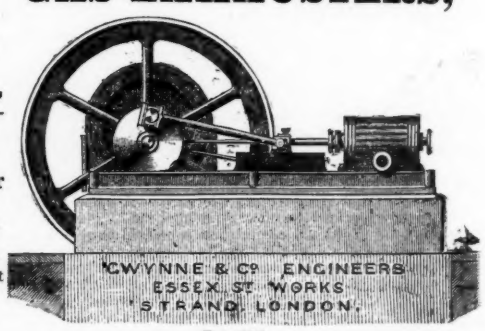


FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. do not pretend to enter into a struggle with other makers in respect to **cheapness.** They have never sought to make **price the chief consideration,** but to produce Machinery of the very highest quality, and the most approved design and arrangement. Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result.

The orders executed this season for Exhausters and alterations to their patented system, amount to over 3,000,000 cubic feet of gas passed per hour, and to over 200 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,
CAN BE HAD ON APPLICATION TO
GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.
Prices and every information on application.

G. & Co. are now manufacturing for a London Gas Company two of their 210,000 cubic feet Patent Gas Exhausters.

DUKE OF HAMILTON'S
LESMAHAGOW GAS COAL.

The superior quality of this well-known Cannel, as wrought by

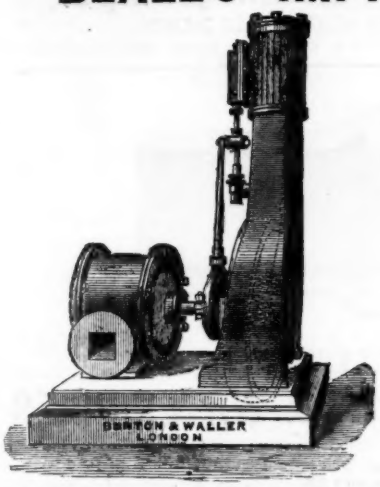
THE NITSHILL AND LESMAHAGOW COAL COMPANY,

Is now generally admitted by all Gas Engineers.

PRICE AND ANALYSIS MAY BE HAD ON APPLICATION TO

JAMES M'KELVIE, HAYMARKET, EDINBURGH.

BEALE'S IMPROVED PATENT GAS-EXHAUSTER



WITH

ENGINE COMBINED

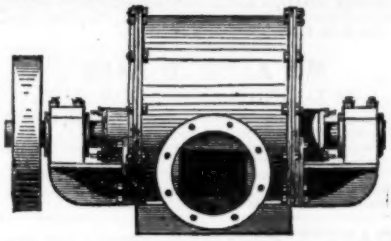
ON

ONE BASE PLATE.

SOLE MAKERS,

GEORGE WALLER & CO.;

Who, since Mr. **BEALE'S** retirement, are the Oldest Makers.



EXHAUSTERS with HORIZONTAL ENGINE combined.
EXHAUSTERS with OUTSIDE BEARINGS.
MAKERS of ENGINES, BOILERS, and GAS MACHINERY.
TAR, LIQUOR, and SYPHON PUMPS. GAS-VALVES in stock, 2 to 30 inches.
SELF-ACTING BYE-PASS VALVES, with Lid and Relieving Lever.
MANN'S and many other descriptions of WATER DISTRIBUTORS,
SCRUBBERS, PURIFIERS, and CONDENSERS.
EXHAUSTERS from 3000 to 60,000, new and second hand, in stock.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, S.E., & at STROUD, GLOUCESTERSHIRE.

WANTED, a situation as Secretary and MANAGER of Gas-Works. The Advertiser has had many years successful experience.
Address E. N., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS-METER MAKERS.

WANTED, an efficient Foreman for the manufacture of dry and unvarying water-line Meters. Also several TINMEN used to the same work.
Apply to T. F., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Gas Company in the West Riding of Yorkshire, making about 30 million feet per annum, a good practical man as GAS MANAGER, to undertake the entire superintendence of the works.
Applications, stating age and salary required, to be sent in not later than the 26th inst.
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"DON" ECONOMIC LUBRICATING OIL is about 40 per cent. cheaper than the kinds heretofore used by Gas Companies, many of whom have adopted it. The Alliance Gas Company say, "Your 'Don' Oil gives us every satisfaction." Trial casks sent on approbation.—DUNCAN BROTHERS, 2, Blomfield St., LONDON, E.C.

COST PRICE SHEETS.

MANUFACTURE AND DISTRIBU- TION OF GAS. These sheets are the same as were laid before the Dublin Meeting of the British Association of Gas Managers; but in the REPRINT, NOTES have been added for the guidance of those using them. Copies of the two sheets may now be had, price 5s.
South Shields, January, 1873. W. J. WARNER.

COOKING AND HEATING BY GAS,
BY
MAGNUS OHREN, A.I.C.E.

NEW AND REVISED EDITION.

Prepared for Gas Companies to circulate amongst their gas consumers.
£1 per 100; £3 15s. per 500; or £6 per 1000.
Address, MAGNUS OHREN, Gas-Works, Lower Sydenham, London, S.E.

FOR SALE—Two Lids for 8-ft. Purifiers, one Cockey's 10-in. VALVE for four Purifiers, and three 10-in. VALVES. All in good condition.
Apply to J. HEPWORTH, Gas-Works, CARLISLE.

GAS-WORKS TO BE LET.

TO BE LET, by Tender, from the 12th of August next, for a term of 14 years (terminable at the end of the fifth, seventh, or tenth year), the works of the Glastonbury Gas and Coke Company, Limited, situate in the town of Glastonbury, Somerset.
Tenders to be forwarded on or before the 15th day of May next, to the undersigned, from whom the terms of letting and all further particulars may be obtained, but the proprietors will not be bound to accept the highest tender.
EDWARD GRIFFIN, Secretary.
Dated, Glastonbury, April 8, 1873.

TO TAR DISTILLERS.

THE Directors of the Guildford Gas- light and Coke Company are prepared to receive TENDERS at per gallon for the surplus TAR LIQUOR produced at their works, for Two years, from the 1st of July next, to be removed from their works as often as required.
Tenders to be sent in to the Office, Gas-Works, Guildford, on or before the 30th of May.
The Directors do not bind themselves to accept the highest or any tender. By order,
Gas-Works, Guildford, JOSH. SHAW, Manager.
April 10, 1873.

CORPORATION GAS-WORKS, DARLINGTON.

TO IRONFOUNDERS.

THE Gas Committee of Darlington Cor- poration are prepared to receive TENDERS for the supply of about 100 lineal yards 12-inch, 1000 lineal yards 6-inch, and 400 lineal yards 3-inch vertically cast IRON SOCKET PIPES, turned and bored for jointing.
The specification may be seen on application to the Engineer, Gas-Works, Darlington, to whom tenders must be sent not later than the 24th inst., stating price per ton, delivered at Railway Depôt, Darlington.
The lowest or any tender not necessarily accepted.
By order, WM. B. EMMERSON, Engineer.

CORPORATION GAS-WORKS, DARLINGTON.

STATION-METER FOR SALE.

THE Gas Committee of the Darlington Corporation have for SALE a STATION-METER, made to pass 12,000 cubic feet of gas per hour, hydraulic valves, bye-pass, pressure and water-line gauges, and tell-tale index complete.
This meter has only been in use a few years, and is in good order, and is for sale in consequence of having been superseded by a larger one. The meter may be seen at the Darlington Gas-Works.
Offers to be forwarded to the undersigned.
By order, WM. B. EMMERSON, Engineer.

TORBANEHILL MINERAL.

For Sale, by Tender,

FOR WHOLE OR PART,

SEVERAL THOUSAND TONS OF THE

Celebrated Torbanehill Mineral,

Saved from the fire at Torbanehill in June last.

The mineral as it at present lies has been examined and analyzed by Dr. WILLIAM WALLACE, Analytical Chemist, Glasgow, who says:
"Very great care was employed to obtain reliable average samples, and the results show that the mineral is not appreciably damaged."
The results of two testings of fair samples of the Coal give 14,680 cubic feet of 43·7 candle gas.

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EXTENSION OF TIME.

THE Directors of the Cleator Moor Gas Company, Limited, are prepared to receive TENDERS for the erection of Buildings, excavation of Gas-Tank, &c., for their works.
Also for the construction of Gasholders, Retorts, Purifiers, supply of Pipes, &c., necessary for completing the works.
Plans and specifications can be seen at the Office of the Company, 68, Leconfield Street, Cleator Moor. The above can be tendered for either separately or jointly.
Sealed tenders, endorsed "Tender for Works," to be sent in to the Secretary, on or before April 22, 1873.
The Directors do not bind themselves to accept the lowest or any tender.
ROWLAND BAXTER, Secretary.

ESTABLISHED 1843.

T. I. BOWN & CO.,
GAS-FITTERS,
IMPORTERS OF BRASS AND GLASS CHANDELIERS
And Fittings of every description for Gas-fitters and Plumbers, including Stock and Dies, Tools, &c.,
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GAS ENGINEERS,
Manufacturers and Contractors for
GAS APPARATUS, GASHOLDERS, TANKS, VALVES, IRON ROOFS, GIRDERS, BRIDGES, &c.,
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Attention is requested to Brodie's Improved Gas Apparatus, admitted to be the best and most economical for lighting factories, railway stations, mansions, country houses, and other isolated buildings.

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WILLIAM FRASER,
INVERKEITHING,
(Owner of the Works at which Fire-Clay Retorts were first made), can supply
RETORTS, FIRE-BRICKS, &c.,
to any extent.
References can be given to managers of above a hundred Gas-Works whom he supplies.
He ships at Charlestown his
CELEBRATED HALBEATH STEAM COALS,
on Navy List.

BUCCLEUCH STREET WORKS,
EDINBURGH, March 25, 1873.

We beg to intimate that we have opened a Factory and Warehouse, under the management of Mr. J. L. Cloudsley, in

KING HENRY'S WALK, BALLS POND ROAD, LONDON, N.
(Near Dalston Junction Station),

At which address we shall be happy to receive orders, and hope that the above premises will increase our ability to meet the requirements of our customers, especially in London and the more southern counties of England, not only for the supply of new Wet and Dry Meters, but also for alterations and repairs.

We are, yours respectfully,
W. AND B. COWAN.

Address:
London—King Henry's Walk, Balls Pond Road, N.
Edinburgh—Buccleuch Street Works.

NOTICE.—REMOVAL OF OFFICE.

W. J. HOLLANDS, Iron Merchant and Hot Water Engineer, 31, Bankside, London, S.E., begs to inform his friends and the public that the lease of the above premises having been disposed of, he has REMOVED his Office to No. 14, SOUTHWARK BRIDGE ROAD, a few doors from Southwark Bridge, where all letters and orders will meet with prompt attention.
March 25, 1873.

Mr. ALFRED LASS,
60, CORNHILL, LONDON, E.C.,

Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

SAMUEL PONTIFEX, Consulting Gas Engineer, having retired from the Great Central Gas Company, is now prepared to furnish PLANS and SPECIFICATIONS, as well as ADVISE Provincial Gas Companies as to the erection of new, or alteration and enlargement of existing works.

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J. T. B. PORTER & A. SILVERTHORNE, C.E., 1, Westminster Chambers, LONDON, S.W., Consulting Engineers.

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CLAYTON'S PATENT SIX-WAY VALVE only requires one valve to work two purifiers; saves more than three-fourths of the connexion-pipes; requires neither tees, elbows, nor bends; no racks or springs to get out of order.

For particulars, apply to CLAYTON, SON, & Co., Gas Engineers, Hunslet, LEEDS.

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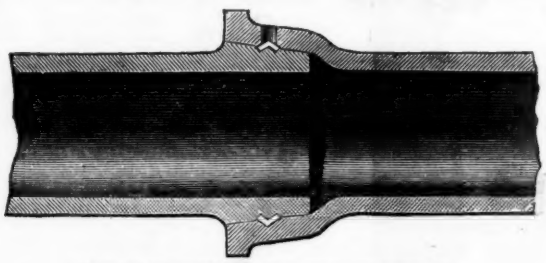
ALL WORK AND MATERIALS GUARANTEED OF THE BEST DESCRIPTION.



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PATENT JOINTS FOR GAS & WATER PIPES

Require no "yarning," no "setting up," nor increased excavation for joint-holes, while less lead and less labour suffice for the making of joints, which have been proved to withstand 95 lbs. on the square inch, have stood the test of more than two years practical use, and must, from the principle of their construction, remain sound.

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HENRY SKOINES,
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SETTING RETORTS,
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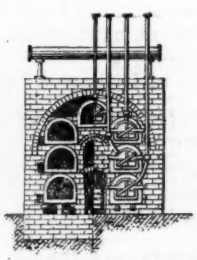
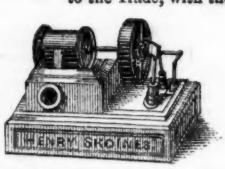
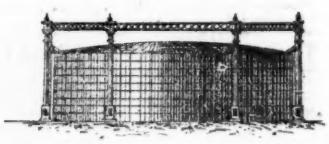
RETORTS RESET, and the whole or any portion of Gas Apparatus supplied to the Trade, with their choice of name and device, if desired.







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IMPROVED VENTILATING SUN-LIGHTS
WITH TALC REFLECTORS AND SELF-ACTING VALVES
TO PREVENT DOWN-DRAUGHT;
VENTILATING GLOBE LIGHTS for DINING-ROOMS, LIBRARIES, &c.
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Drawings and Prices upon application.

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Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,

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STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

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PATENT PLATINUM

GASLIGHT PERFECTER.

Extract from Report by Dr. Letheby:—

"The results have been very remarkable, for they show an average increase of 63 per cent. on the illuminating power of the gas. I am of opinion, therefore, that the invention is of great practical value."

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"Scholl's Platinum Perfecter is one of the most important inventions of modern times in connexion with the burning of coal gas."

Price 1s. each for Fishtail Burners.

To be had retail of Gas-Fitters and Ironmongers.

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*** Further testimonials from Drs. Frankland and Crooks, showing the great practical value of this invention, will be shortly published.

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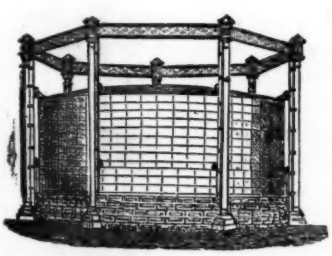

S. C. AND SONS undertake Contracts of any magnitude for the Erection of new and Remodelling of existing Gas-Works, for Gasholders, Cast and Wrought Iron Tanks, Iron Roofs, and every description of Apparatus for the Manufacture and Distribution of Gas.

Special attention is invited to their "Improved Condenser," which is very effective, and much approved; also to their patterns of Annular and other Condensers, Scrubbers, and Purifiers, of all sizes, which they arrange either with Centre or Ordinary Slide Valves.

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S. C. AND SONS undertake the Supply and Laying of Mains for Gas and Water, and supply all Castings, Connexions, and Fittings for Retort-House, Works generally, and for Streets. They also supply Valves of all descriptions, Iron and Clay Retorts, Hotpressed Retort-Lids, Steel Charging-Scoops of improved make, for which they have special machinery, Improved Coke and Coal Barrows, Cross-Bars and Screws, Bolts and Nuts, Furnace and Stoking Tools, Iron and Wood Purifier-Sieves, Lead, Yarn, Borings, &c., including every requisite whatsoever for a Gas-Work, a well-assorted stock being kept of those goods most in request.

SOLE MAKERS OF BRETT'S PATENT COKE BARROW.

Experienced Retort Setters sent to any part of the Kingdom.

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IMPROVED WOOD SIEVES

FOR

GAS PURIFIERS & SCRUBBERS.

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The above Sieves are used by all the Gas Companies in London and a great many in the country. Their utility, durability, and cheapness combined, render them superior to all others.

Testimonials from Gas Engineers who have tested their qualities forwarded on application.

All orders punctually attended to, and estimates given if required.

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For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

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MANUFACTURERS OF

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GAS ENGINEERS,

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Of any extent at Home and Abroad,

GOWTS BRIDGE WORKS, LINCOLN,

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BRONNER'S PATENT GAS-BURNERS give 99 per cent. of light, as compared with 27 per cent. given by ordinary burners, with equal consumption of gas.—*Vide* "Gas Referees Report," published June, 1869.

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BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, GHENT.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications addressed to J. SUGG & CO., GHENT, will receive immediate attention.

CATHELS & TERRACE'S Patent Four-WAY DISC GAS-VALVE is the simplest and best Valve for Purifiers, and as a By-pass for other apparatus in Gas-Works. It is always gas-tight, and has no springs, ground faces, or other delicate parts. By its use the flow of the gas cannot be accidentally stopped, and it never sticks.

For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, Foundry and Brass Works, ROTHERHAM.

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.

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Manufacturer of Clay Retorts, Fire-Bricks and every description of Fire-Clay Goods.

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WOOD SIEVES.—WOOD SIEVES.

Estimates given and Contracts taken by the Manufacturer

GEORGE MACKANESS,

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These Sieves are made with parallel or bevel bar, and guaranteed to be well seasoned yellow deal, and not common spruce so generally used.

N.B.—Specimens sent free on application.

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WENLOCK IRON WHARF, 20 & 22, WHARF ROAD,

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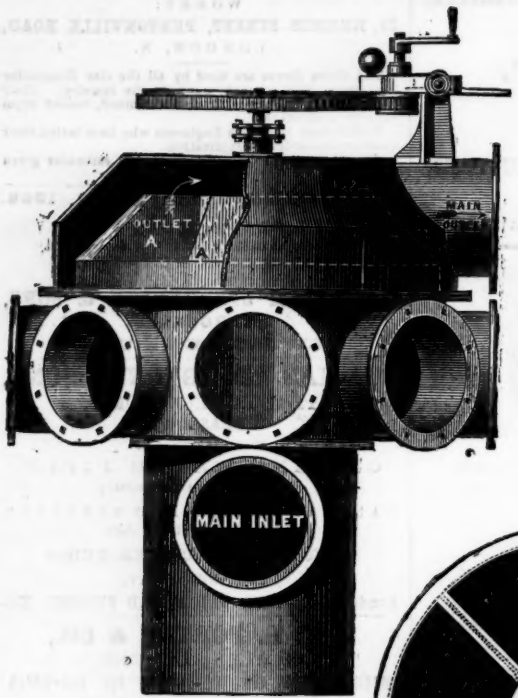
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.

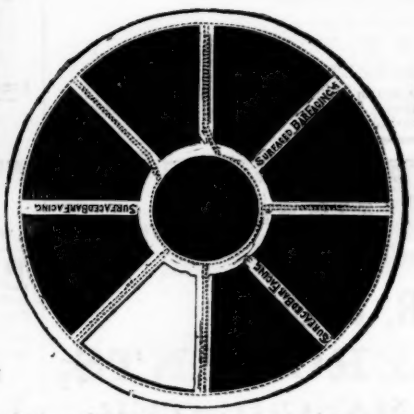
N.B.—Orders for Cast-Iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention. CHARLES HORSLEY, Agent.

C. & W. WALKERS' PATENT CENTRE-VALVES.



Elevation of the Centre-Valve for four Purifiers. The safety cover is shown broken, to enable the Valve itself, which is inside, to be seen.

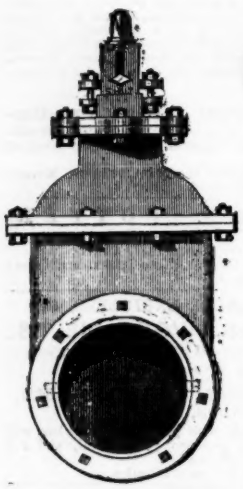
Plan of the Body, showing the Valve lying in it, with three of the facings, which were formerly exposed to settlements of dirt, carbon, naphthaline, &c., but which are now always covered by the surfaced bar-facings of the Valve. (See below.)



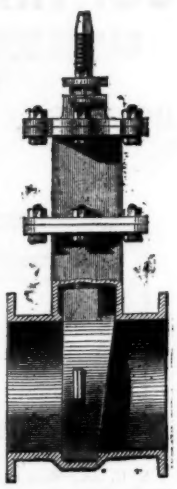
Plan of the Valve, or upper portion, showing the surfaced bar-facings referred to above.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A very considerable improvement and saving is effected in the cost of the connecting-pipes.

FOUR-WAY CENTRE-VALVES FORMING INLET, OUTLET, AND BYE-PASS.



C. & W. WALKERS'
DOUBLE-FACED GAS-VALVES.



These solidly constructed double-faced Gas-Valves are superseding the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.

GASHOLDERS, TELESCOPE & SINGLE-LIFT, of LARGEST DIMENSIONS.

PURIFIERS, SCRUBBERS, CONDENSERS of most Improved Description.

WOOD SIEVES FOR PURIFIERS,

Which have now been in use for more than ten years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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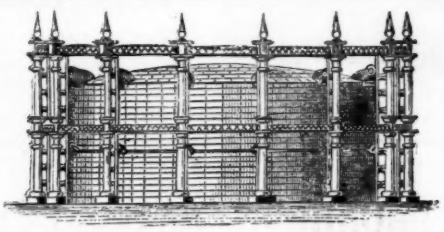

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For particulars and terms, apply to E. GODDARD, Sole Agent, Gas-Works, IPSWICH.

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CATOPTRIC LAMP,

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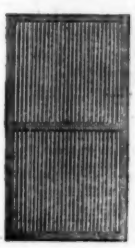

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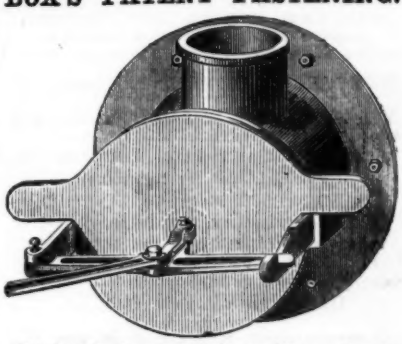

This fastening for retort-lids is proved by experience to be the most simple, effective, and durable of any that have ever been used.

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The lid is rapidly secured and gas saved.

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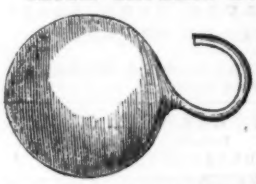

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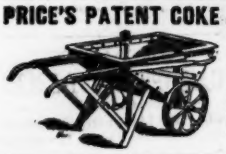

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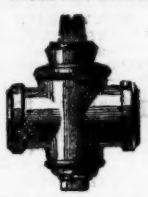
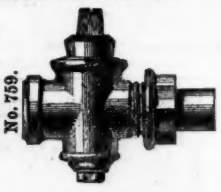
No. 758. 

No. 759. 

The bodies of these Taps are made of Iron, black or galvanized, and the Plugs of Patent Metal. They are warranted not to set fast or corrode as do iron or brass Cocks, will always work easily, are strong, well made, durable, of little or no intrinsic value, and, therefore, not likely to be stolen; and the PRICES are (especially upon the larger sizes) FULLY 50 PER CENT. LESS THAN BRASS COCKS.

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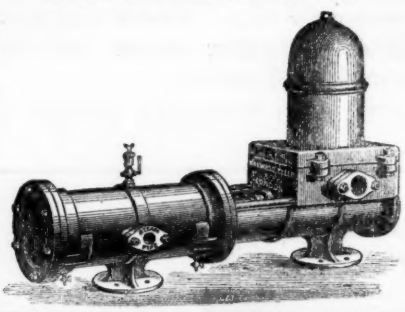

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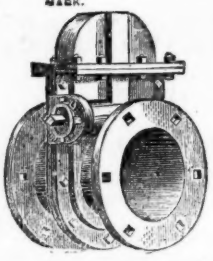

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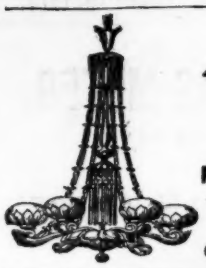

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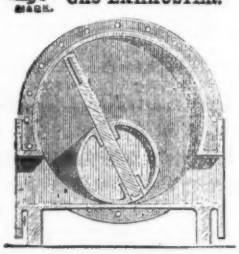

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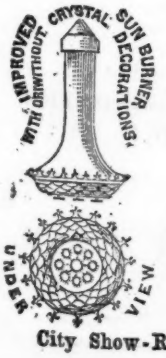

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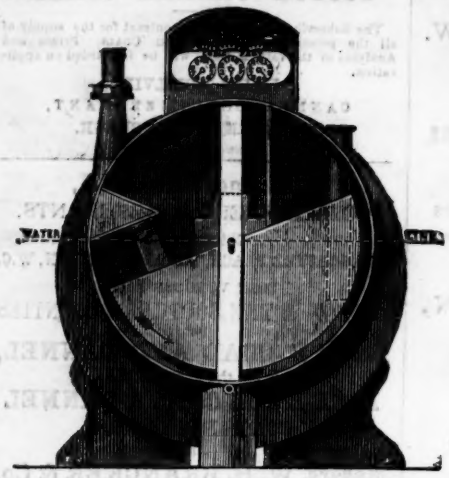

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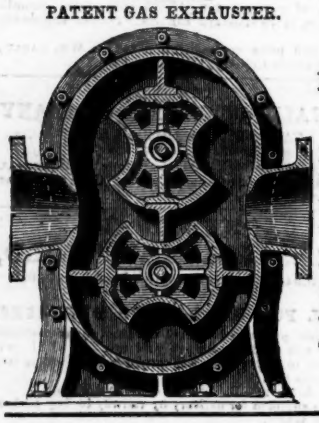

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